



## Air Quality Permitting Statement of Basis

Tier II Operating Permit No. T2-020114  
AIRS No. 017-00006

Tri-Pro Cedar Products, Inc.  
Oldtown, Idaho

**Prepared by:**

Shawnee Y. Chen, P.E.,  
Engineer, Technical 1  
Technical Services Division

Daniel P. Salgado  
Regional Permit Program Coordinator  
Air Quality Division

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FINAL PERMIT

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## ACRONYMS, UNITS, AND CHEMICAL NOMENCLATURE

acfm	actual cubic feet per minute
AFS	AIRS Facility Subsystem
AIRS	Aerometric Information Retrieval System
AP-42	Compilation of Air Pollutant Emission Factors
AQCR	Air Quality Control Region
ASTM	American Society for Testing and Materials
Btu	British thermal unit
CAA	Clean Air Act
CFR	Code of Federal Regulations
CO	Carbon monoxide
DEQ	Department of Environmental Quality
dscf	dry standard cubic feet
EF	Emissions Factor
EPA	Environmental Protection Agency
gpm	Gallons per minute
gr	grain (1 lb = 7,000 grains)
gr/scf	grain per standard cubic feet
HAP	Hazardous Air Pollutants
IDAPA	A numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
km	Kilometer
lb/hr	pound per hour
lb/day	pound per day
lb/T	pound per ton
MACT	Maximum Available Control Technology
Mbf	Thousand Board Feet
MMBtu	Million British thermal units
NAAQS	National Ambient Air Quality Standards
NESHAP	Nation Emission Standards for Hazardous Air Pollutants
NO <sub>2</sub>	Nitrogen dioxide
NO <sub>x</sub>	Nitrogen oxides
NSPS	New Source Performance Standards
O <sub>3</sub>	Ozone
Pb	Lead
PM	Particulate Matter
PM <sub>10</sub>	Particulate Matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
PSD	Prevention of Significant Deterioration
PTC	Permit to Construct
PTE	Potential to Emit
<i>Rules</i>	<i>Rules for the Control of Air Pollution in Idaho</i>
scf	Standard cubic feet
scf/min	standard cubic feet per minute
SIC	Standard Industrial Classification
SIP	State Implementation Plan
SM	Synthetic Minor
SO <sub>2</sub>	sulfur dioxide
SO <sub>x</sub>	Sulfur oxides
Tri-Pro	Tri-Pro Cedar Products, Inc.
T/yr	Tons per year
VOC	Volatile Organic Compound

## 1. PURPOSE

The purpose for this memorandum is to satisfy the requirements of IDAPA 58.01.01 Sections 400 through 406, *Rules for the Control of Air Pollution in Idaho*, for Tier II operating permits.

## 2. PROJECT DESCRIPTION

This project is for a Tier II operating permit for Tri-Pro Cedar Products, Inc. (Tri-Pro) located at Oldtown, Idaho. Tri-Pro received a modified PTC on December 17, 2001. The modified PTC added permit conditions to cease operations of hogged fuel fired boilers, to formally limit the facility's annual maximum lumber production to 90 million board feet, and to add a 7.87-MMBtu/hr propane-fired boiler. With this modified PTC, the facility became a SM facility and does not need a Tier I operating permit. No modeling analysis was conducted while issuing this modified PTC. However, Tri-Pro was required in the modified PTC to submit a Tier II operating permit application to demonstrate compliance with NAAQS within six months of the PTC issuance. Tri-Pro's July 24, 2002 submittal mentioned that Tri-Pro has decided to permanently discontinue operation of the Olivine Woodwaste Incinerator and has capped the exhaust of the No. 5 Trimmer Cyclone. The Tier II operating permit will address the aforementioned issues and keep the facility in a SM status.

## 3. FACILITY DESCRIPTION

Tri-Pro operates a lumber mill that includes a sawmill, dry kilns, a planer mill, and associated equipment to process raw logs into dried dimensional lumber. A plant flow diagram can be found in Appendix E of this memorandum.

## 4. SUMMARY OF EVENTS

June 14, 2002	Application received
July 24, 2002	Additional information received
August 5, 2002	Incompleteness letter sent
December 5, 2002	Response to incompleteness letter received
December 16, 2002	Additional information received through fax and mail
December 17, 2002	Additional information received through fax
December 18, 2002	Additional information received through email
January 2, 2002	Additional information received through email
January 3, 2003	Completeness letter issued
March 13, 2003	Facility draft permit issued
April 21, 2003	Proposed permit issued
May 7, 2003 – June 5, 2003	Public comment period – No comments received

## 5. PERMITTING HISTORY

December 17, 2001	PTC, removal of seven dutch oven hog fuel-fired boilers
April 25, 2000	PTC, ownership change and equipment reconfiguration at the planing mill
August 5, 1993	Operating permit, modification on emissions limits, etc.
January 24, 1990	Operating permit

## 6. TECHNICAL ANALYSIS

### 6.1 Emissions Estimates

#### *Propane-Fired Boiler:*

The boiler was manufactured by Cleaver Brooks. It was installed in 2000. It appears to be self-exempt. The boiler has a design heat input rate of 7.87 MMBtu/hr. The steam generated by this boiler is for building use and dry kiln use.

The stack parameters are detailed in Table 6.1.1. There is a rain cap on the top of the stack. There are no control devices used for the boiler.

Table 6.1.1 STACK PARAMETERS

Parameter	Boiler Stack
Height (feet)	40
Diameter (feet)	2.5
Flow Rate (minimum acfm)	8,000 (2,423) *
Temperature (minimum °F)	350

\* The 8,000 value listed was submitted by the applicant; value in parentheses is estimated by Department of Environmental Quality (DEQ) using combustion evaluation and the value used in modeling analysis.

According to the application, the propane heating value is 91.5 MMBtu/1000 gal, and the maximum fuel usage is 86 gallons per hour. Emissions estimates of PM<sub>10</sub>, NO<sub>x</sub>, VOC and CO are based on emissions factors published in Table 1.5-1 of AP-42, Rev 10/96. The emissions estimate for SO<sub>2</sub> was provided by Tri-Pro's consultant based on Santa Barbara County Air Pollution Control District (SBAPCD) Engineering Division, application processing and calculations guidance for SO<sub>x</sub> emission factors for gaseous fuel. The detailed SO<sub>x</sub> emissions calculation can be found in Appendix B of this memorandum or in Tri-Pro's December 5, 2002 submittal pp.3-4.

The emissions rates were estimated using the following method:

Hourly emissions rate (PM<sub>10</sub>, or CO, or VOC, lb/hr)

$$= (7.87 \text{ MMBtu/hr}) / (91.5 \text{ MMBtu}/10^3 \text{ gal}) \times \text{EF of PM}_{10}, \text{ CO, or VOC (lb}/10^3 \text{ gal)}$$

Annual emissions rate (PM<sub>10</sub>, or CO, or VOC, T/Yr)

$$= \text{hourly emissions rate (lb/hr)} \times (8760 \text{ hr/Yr}) / (2000 \text{ lb/T})$$

#### *Lumber Dry Kilns:*

The dry kilns are electric heated dehumidification kilns. The overall dimensions of the dry kilns are 170 ft by 100 ft. The kiln system has two 30- x 30-in vents and four 24- x 24-in vents. They are evenly spaced on the kiln roofs. The exhausted streams from these vents are combined through two ducts and discharged through two horizontal exhausting vents with no control devices on them. The exit temperature is 70°F. The vent height is 20 ft. The description of dehumidification kilns and a photo of Tri-Pro kilns can be found in Appendix B of this memorandum or in Tri-Pro's December 5 and 16, 2002 submittals.

Emissions factors for PM, PM<sub>10</sub>, and VOC emissions from the kilns were taken from "Idaho DEQ Emission Factor Guide for Wood Industry" (rev.11/99), which can be found in Appendix C of this memorandum. According to this DEQ guide the emissions factors for lumber dry kilns are 0.33 lbs/Mbf for PM emissions, 0.19 lbs/Mbf for PM<sub>10</sub> emissions, and 1.50 lbs/Mbf for VOC emissions. A control efficiency of 90% was used while estimating PM and PM<sub>10</sub> emissions from the kilns. The justification of this was provided in Tri-Pro's December 16, 2002 submittal, which says "...The control factor of 90% was applied because the air is re-circulated within the kiln and very little air is discharged. Total volume of air discharge is estimated to be less than 10% of the total volume of air discharged from a traditional steam-heated kiln. The condenser system functions like a wet scrubber, capturing air-borne particulate in the condensed steam and removing the particulate matter with the water..."

Per the Tri-Pro December 17, 2002 submittal, the lumber kilns would operate for 6,000 hours per year during peak operation after subtracting kiln loading and unloading time. The kilns have a throughput limit of 90 million board feet per consecutive 12-month period. The hourly, daily, and annual emissions rates are calculated as the following:

Annual PM<sub>10</sub> emissions rate (T/Yr)

$$= 90,000 \text{ Mbf/yr} \times 0.19 \text{ lbs/Mbf} \times (1-0.9) / (2,000 \text{ lb/T}) = 0.86 \text{ T/Yr}$$

Hourly PM<sub>10</sub> emissions rate (lb/hr)

$$= 90,000 \text{ Mbf/yr} \times 0.19 \text{ lbs/Mbf} \times (1-0.9) / (6,000 \text{ hrs/Yr})$$

$$= (1,710 \text{ lb/yr}) / (6,000 \text{ hr/Yr})$$

$$= 0.285 \text{ lb/hr}$$

Daily PM<sub>10</sub> emissions rate (lb/day)

$$= 0.285 \text{ lb/hr} \times 24 \text{ hr/day} = 6.84 \text{ lb/day}$$

Annual VOC emissions rate (T/Yr)

$$= 90,000 \text{ Mbf/yr} \times 1.15 \text{ lbs/Mbf} / (2000 \text{ lb/T}) = 67.5 \text{ T/Yr}$$

#### **Process Equipment:**

The standard cubic feet per min (scf/min) design capacities, which were provided in Tri-Pro's Tier II operating permit application, were used to estimate PM and PM<sub>10</sub> emissions from the cyclones to which the process equipment vent.

Emissions factors for PM and PM<sub>10</sub> emissions from these cyclones were taken from "Idaho DEQ Emission Factor Guide for Wood Industry" (rev.11/99), which can be found in appendix C of this memorandum. According to this DEQ guide the emissions factors for cyclones are 0.03 gr/scf for PM emissions, and 0.015 gr/scf for PM<sub>10</sub> emissions.

With the operating limit of 16 hours per calendar day for each cyclone, the emissions rates were estimated using the following method:

Hourly PM<sub>10</sub> emissions rate (lb/hr)

$$= \text{design capacity (scf/min)} \times 0.015 \text{ gr/scf} / 7000 \text{ (gr/lb)} \times 60 \text{ min/hr}$$

Daily PM<sub>10</sub> emissions rate (lb/day)

$$= \text{hourly PM}_{10} \text{ emissions rate (lb/hr)} \times 16 \text{ hr/day}$$

Annual PM<sub>10</sub> emissions rate (T/Yr)

$$= \text{daily PM}_{10} \text{ emissions rate (lb/day)} \times 365 \text{ day/Yr} / 2000 \text{ (lb/T)}$$

***Debarker, Bark Hog, Sawmill, Sawmill Screen, Sawmill Chipper, Planer Hog, and Planer Chipper Screen:***

Emissions of PM and PM<sub>10</sub> from these sources were estimated based on the material throughput rates presented in Tri-Pro's Tier II operating permit application.

Emissions factors for PM and PM<sub>10</sub> emissions estimation from these sources were taken from "Idaho DEQ Emission Factor Guide for Wood Industry" (11/99 revision), which can be found in Appendix C of this memorandum.

Several assumptions were made while estimating the emissions:

- The emissions from the Bark Hog, Sawmill Chipper, and Planer Hog would be similar to the emissions from sawing logs. Therefore, the EF for log sawing was used to estimate these emissions.
- The emissions from the Sawmill Screen and Planer Chipper Screen would be similar to the emissions from target box while loading the bin. This assumption was made by Tri-Pro through site observation. Therefore the EF for the target box was used to estimate these emissions.
- A 99% control efficiency was applied to the Sawmill because the log sawing occurs indoors with pneumatic dust pickup system, per the Tri-Pro Tier II operating permit application.

The emissions rates were estimated using the following method:

Hourly PM<sub>10</sub> emissions rate (lb/hr)

$$= \text{throughput (T/Yr)} / (8760 \text{ hr/Yr}) \times \text{EF lb/Ton} \times (1 - \text{control efficiency \%})$$

Annual PM<sub>10</sub> emissions rate (T/Yr)

$$= \text{throughput (T/Yr)} \times \text{EF lb/Ton} / 2000 \text{ (lb/T)} \times (1 - \text{control efficiency \%})$$

***Wood Byproducts Bins Loadout:***

Wood byproducts generated during the creation of dimensional lumber generally consist of bark, sawdust, chips and shavings. These byproducts are generally moved from place to place through either pneumatic devices or conveyors that deliver the byproduct to bins or trucks. Fugitive emissions are generated while the bins, or No. 5 Planer Chip Cyclone, or no. 12 Bark Cyclone drops the wood byproduct into trucks. The wood byproducts bins consist of Fuel Bin Hog Fuel Storage (vertical tank bin), Fuel Bin Shavings (silo), Sawdust Bin, Chip Truck Bin, and Shavings Truck Bins.

Emissions of PM and PM<sub>10</sub> from wood byproduct loadout activities were estimated based on the material throughput rates presented in Tri-Pro's Tier II operating permit application and EFs from "Idaho DEQ Emission Factor Guide for Wood Industry" (11/99 revision), which can be found in Appendix C of this memorandum. The EFs and material throughputs are listed in Appendix A of this memorandum.

The following assumptions were made while estimating the emissions from truck bin loadout:

- The emissions from the truck bin loadout would be similar to the emissions from sawdust handling based on site observation. Therefore, EFs for sawdust handling were used to estimate bin loadout emissions.
- Control efficiency of 50% was applied to Shavings Truck Bins loadout because the loadout areas are sheltered on the sides by wooden walls.

The emissions rates were estimated using the following method:

Hourly PM<sub>10</sub>, or PM, emissions rate (lb/hr)

$$= \text{throughput (T/Yr)} / (8760 \text{ hr/Yr}) \times \text{EF of PM}_{10} \text{ or PM (lb/T)} \times (1 - \text{control efficiency \%})$$

Annual PM<sub>10</sub>, or PM, emissions rate (T/Yr)

$$= \text{throughput (T/Yr)} \times \text{EF lb/Ton} / 2000 \text{ (lb/T)} \times (1 - \text{control efficiency \%})$$

### Emergency Generators:

The facility does not have emergency generators on site per Tri-Pro's December 15, 2002 submittal.

Table 6.1.2 provides a summary of potential emissions for the facility including fugitive emissions.

Table 6.1.2 CONTROLLED POTENTIAL EMISSIONS

Potential Emissions <sup>a</sup> - Hourly (lb/hr), and Annual <sup>b</sup> (T/yr)										
Source Description	PM <sub>10</sub>		NO <sub>x</sub>		CO		VOC		SO <sub>x</sub>	
	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Propane-fired boiler	0.03	0.15	1.2	5.27	0.16	0.70	0.03	0.11	0.04	0.16
Debarking (fugitive)	0.34	1.49								
Bark hog (fugitive)	0.58	2.55								
Sawmill (sawing)	0.06	0.27								
Sawmill screen	0.02	0.09								
Sawmill chipper	0.08	0.35								
Lumber dry kilns	0.29	0.86					22.50	67.5		
Planer hog	0.25	1.08								
Planer chipper screen	0.01	0.03								
Fuel bin (cyclone No. 1)	1.29	3.75								
Shavings bin (cyclone No. 2) (alternated with the other No. 7 shavings bin cyclone)	2.38 <sup>c</sup>	6.95 <sup>c</sup>								
Planer shavings (cyclone No. 3)	2.99	8.74								
Trimmer bin (cyclone No. 4)	2.70	7.88								
Planer chipper (cyclone No. 5)	1.03	3.00								
Trimmer (cyclone No. 6)	0	0								
Shavings bin (cyclone No. 7) (alternated with the other No. 2 shavings bin cyclone)	0.93 <sup>c</sup>	2.70 <sup>c</sup>								
Bark (cyclone No. 12)	1.93	5.63								
Fuel bin hog fuel storage loading	1.69	7.40								
Fuel bin hog fuel storage loadout (fugitive) <sup>d</sup>	1.05	4.59								
Sawdust bin loading	1.40	6.14								
Sawdust bin truck loadout (fugitive)	0.87	3.81								
Chip bin loading with target box	0.05	0.23								
Chip bin loadout (fugitive)	1.45	6.35								
No. 5 cyclone, direct loadout to trucks	0.44	1.94								
Shavings truck bins loading	1.32	5.80								
Shavings truck bins loadout (fugitive) <sup>d</sup>	0.41	1.80								
Mobile sources dust - unpaved (fugitive)	0.08	0.33								
Mobile source dust - paved (fugitive)	0.06	0.26								

<sup>a</sup> As determined by a pollutant-specific U.S. EPA reference method, a DEQ-approved alternative, or as determined by DEQ's emissions estimation methods used in this permit analysis.

<sup>b</sup> As determined by multiplying the actual or allowable (if actual is not available) pound per hour emissions rate by the allowable hours per year that the process(es) may operate(s), or by actual annual production rates.

<sup>c</sup> Cyclones No. 7 cyclone and No. 2 cyclone do not operate at the same time; they are alternated.

<sup>d</sup> Emissions from Fuel Bin Shavings loadout are included in Shavings Truck Bins loadout and Fuel Bin Hog Fuel Storage loadout.

## 6.2 Modeling

The modeling was performed by Tri-Pro's consultant, Lorenzen Engineering, Inc. Lorenzen Engineering, Inc. chose the EPA-approved ISCST3 model. The model was applied consistent with the EPA's *Guideline on Air Quality Models* (2001) and the state of Idaho's draft *Air Quality Modeling Guideline*.

The modeling demonstrated that ambient impacts of 3-hour, 24-hour and annual SO<sub>2</sub>, and 1-hour and 8-hour CO were below the significant contribution levels identified in IDAPA 58.01.01.006.93.

Ambient impacts from annual and 24-hour PM<sub>10</sub> and annual NO<sub>2</sub> are presented in Table 6.2.1. For additional details regarding facility-wide modeling results, please see the modeling memorandum in Appendix G.

Table 6.2.1 FULL IMPACT ANALYSIS FOR CRITERIA POLLUTANTS (FACILITY-WIDE EMISSIONS)

Pollutant	Averaging Period	Ambient Impact (µg/m <sup>3</sup> ) <sup>a,b</sup>	Background Conc. (µg/m <sup>3</sup> ) <sup>a,b</sup>	Total Ambient Conc. (µg/m <sup>3</sup> ) <sup>a,b</sup>	Regulatory Limit (µg/m <sup>3</sup> ) <sup>a,b</sup>	Percent of NAAQS <sup>c</sup>
PM <sub>10</sub> <sup>d</sup>	24-hour	48.6 <sup>e</sup> (42.8 <sup>f</sup> )	81 (81)	129.6 (123.8)	150	86 (83)
	Annual	6.7 <sup>g</sup> (8.2 <sup>h</sup> )	27 (26)	33.7 (34.2)	50	67 (68)
Nitrogen dioxide (NO <sub>2</sub> )	Annual	5.0 <sup>g</sup> (8.3 <sup>h</sup> )	32 (32)	37.0 (40.3)	100	37 (40)

<sup>a</sup> Concentration in micrograms per cubic meter

<sup>b</sup> First values listed are impacts submitted by the applicant; values in parentheses are results from DEQ verification modeling

<sup>c</sup> IDAPA 58.01.01.577

<sup>d</sup> Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers

<sup>e</sup> Impact modeled by Lorenzen (impacts for averaging periods of 24 hours and less are the modeled maximum of 2<sup>nd</sup> highest results at each receptor)

<sup>f</sup> Maximum 6<sup>th</sup> highest modeled value at any receptor

<sup>g</sup> Maximum 1<sup>st</sup> highest modeled value at any receptor

## 6.3 Toxics

Facility-wide HAP emissions are difficult to quantify due to the lack of EFs for HAPs with respect to the kilns. The only DEQ-approved kiln emissions study that contained any HAP EFs was conducted by Oregon State University (OSU) entitled, "Small-Scale Kiln Study Utilizing Ponderosa Pine, Lodgepole Pine, White Fir and Douglas Fir." The study tested for and derived EFs for methanol and formaldehyde. The EFs of 0.023 lb/Mbf for methanol (Douglas-fir) and 0.001 lb/Mbf for formaldehyde (Douglas-fir) were used to estimate the emissions from Tri-Pro kilns. Justification for using these EFs was provided by the Tri-Pro consultant on December 18, 2002; it reads "Tri-Pro Cedar Products processes only cedar. The OSU study did not use cedar. Cedar has lower moisture and VOC content than most other softwoods. Douglas-fir was chosen as the most representative wood to use for the cedar analysis." Using the permitted kiln lumber throughput of 90,000 Mbf/yr, the estimated annual emissions are 1.04 T/yr for methanol and 0.01 T/yr for formaldehyde. Facility-wide aggregated HAP emissions are equal to the total HAP emissions from the kilns of 1.05 T/yr. The HAP emissions from the propane-fired boiler were negligible. The highest single HAP emission is 1.04 T/Yr of methanol from the kilns. On the basis of the aforementioned calculations, the HAP emissions from Tri-Pro satisfy the HAP minor source thresholds of below 10 T/yr for a single HAP and 25 T/yr for aggregated HAPs.

## 6.4 Area Classification

Tri-Pro, Oldtown, Idaho, is located in AQCR 063. The area is classified as attainment / unclassifiable for all federal and state criteria air pollutants (i.e., PM<sub>10</sub>, SO<sub>x</sub>, O<sub>3</sub>, NO<sub>2</sub>, CO, and Pb). There is no Class One Area within 10 km of the facility.

## 6.5 **Facility Classification**

The facility is not a designated facility as defined in IDAPA 58.01.01.006.27. The AIRS Facility Subsystem classification is SM. The facility is not subject to PSD permitting requirements for a major modification because the facility's PTE is less than 250 T/yr. This facility is a lumber mill, SIC code 2421.

## 7. **PERMIT REQUIREMENTS**

### ***Scope***

The purpose of this Facility-wide Tier II operating permit is to fulfill the requirement in Permit Condition 1.10 in PTC No. 017-0006 issued December 17, 2001 to assure compliance with NAAQS in accordance with IDAPA 58.01.01.401.03, and to keep the facility in an SM status.

### ***Regulatory Review***

This facility is subject to the following permitting requirements:

IDAPA 58.01.01.401 .....	Tier II Operating Permit
IDAPA 58.01.01.403 .....	Permit Requirements for Tier II Sources
IDAPA 58.01.01.404.01(c).....	Opportunity for Public Comment
IDAPA 58.01.01.404.04 .....	Authority to Revise or Renew Operating Permits
IDAPA 58.01.01.405 .....	Conditions for Tier II Operating Permit
IDAPA 58.01.01.406 .....	Obligation to Comply
IDAPA 58.01.01.470 .....	Permit Application Fees for Tier II Permits
IDAPA 58.01.01.625 .....	Visible Emission Limitation
IDAPA 58.01.01.650 .....	General Rules for the Control of Fugitive Dust

### ***Facility-wide Conditions***

## 7.1 **Fugitive Particulate Matter – IDAPA 58.01.01.650-651**

### ***Requirement***

Fugitive emissions for the bin loadout and other fugitive sources (e.g., debarking, bark hog) have not been included in the model analysis. These fugitive emissions are generated during batch type operations at short intervals. Visible emissions inspections and a visible emissions control plan are more practically efficient to control fugitive emissions. Permit Condition 2.1 details the requirements on how to reasonably control fugitive emissions.

### ***Compliance Assurance***

Facility-wide Condition 2.2 states that the permittee is required to monitor and maintain records of the frequency and the methods used by the facility to reasonably control fugitive particulate emissions. IDAPA 58.01.01.651 gives some examples of ways to reasonably control fugitive emissions which include using water or chemicals, applying dust suppressants, using control equipment, covering trucks, paving roads or parking areas, and removing materials from streets.

Facility-wide Condition 2.3 requires that the permittee maintain a record of all fugitive dust complaints received. In addition, the permittee is required to take appropriate corrective action as expeditiously as practicable after receipt of a valid complaint. The permittee is also required to maintain records that include the date that each complaint was received and a description of the complaint, the permittee's assessment of the validity of the complaint, any corrective action taken, and the date the corrective action was taken.

To ensure that the methods being used by the permittee to reasonably control fugitive PM emissions whether or not a complaint is received, Facility-wide Condition 2.4 requires that the permittee conduct periodic inspections of the facility. The permittee is required to inspect potential sources of fugitive emissions during daylight hours and under normal operating conditions. If the permittee determines that the fugitive emissions are not being reasonably controlled the permittee shall take corrective action as expeditiously as practicable. The permittee is also required to maintain records of the results of each fugitive emission inspection.

Both Facility-wide Conditions 2.3 and 2.4 require the permittee to take corrective action as expeditiously as practicable. In general, DEQ believes that taking corrective action within 24 hours of receiving a valid complaint or determining that fugitive particulate emissions are not being reasonably controlled meets the intent of this requirement. However, it is understood that, depending on the circumstances, immediate action or a longer time period may be necessary.

Permit Condition 5.2 requires permittee to conduct additional fugitive emissions monitoring on bin loadout activities for the first three months after permit issuance.

## **7.2 Control of Odors - IDAPA 58.01.01.775-776**

### ***Requirement***

Facility-wide Condition 2.5 and IDAPA 58.01.01.776 both state that: *"No person shall allow, suffer, cause or permit the emission of odorous gases, liquids or solids to the atmosphere in such quantities as to cause air pollution."* This condition is currently considered federally enforceable until such time as it is removed from the SIP, at which time it will be a state-only enforceable requirement.

### ***Compliance Assurance***

Facility-wide Condition 2.6 requires the permittee to maintain records of all odor complaints received. If the complaint has merit, the permittee is required to take appropriate corrective action as expeditiously as practicable. The records are required to contain the date that each complaint was received and a description of the complaint, the permittee's assessment of the validity of the complaint, any corrective action taken, and the date the corrective action was taken.

Facility-wide Condition 2.6 requires the permittee to take corrective action as expeditiously as practicable. In general, DEQ believes that taking corrective action within 24 hours of receiving a valid odor complaint meets the intent of this requirement. However, it is understood that, depending on the circumstances, immediate action or a longer time period may be necessary.

### 7.3 Visible Emissions - IDAPA 58.01.01.625

#### ***Requirement***

IDAPA 58.01.01.625 and Facility-wide Condition 2.7 state that *"(No) person shall discharge any air pollutant to the atmosphere from any point of emission for a period or periods aggregating more than three minutes in any 60-minute period which is greater than twenty percent (20%) opacity as determined . . ."* by IDAPA 58.01.01.625. This provision does not apply when the presence of uncombined water, NO<sub>x</sub>, and/or chlorine gas is the only reason for the failure of the emission to comply with the requirements of this rule.

#### ***Compliance Assurance***

To ensure reasonable compliance with the visible emissions rule, Facility-wide Condition 2.8 requires that the permittee conduct routine visible emissions inspections of the facility. The permittee is required to inspect potential sources of visible emissions, during daylight hours and under normal operating conditions. The visible emissions inspection consists of a see/no see evaluation for each potential source of visible emissions. If any visible emissions are present from any point of emission covered by this section, the permittee must either take appropriate corrective action as expeditiously as practicable, or perform a Method 9 opacity test in accordance with the procedures outlined in IDAPA 58.01.01.625. A minimum of thirty observations shall be recorded when conducting the opacity test. If opacity is determined to be greater than 20% for a period or periods aggregating more than three minutes in any 60-minute period, the permittee must take corrective action and report the exceedance in its annual compliance certification and in accordance with the excess emissions rules in IDAPA 58.01.01.130-136. The permittee is also required to maintain records of the results of each visible emissions inspection and each opacity test when conducted. These records must include the date of each inspection, a description of the permittee's assessment of the conditions existing at the time visible emissions are present, any corrective action taken in response to the visible emissions, and the date corrective action was taken.

Should a specific emission unit have a specific compliance demonstration method for visible emissions that differs from Facility-wide Condition 2.8, then the specific compliance demonstration method overrides the requirement of condition 2.8. Facility-wide Condition 2.8 is intended for small sources that would generally not have any visible emissions.

Facility-wide Condition 2.8 requires the permittee to take corrective action as expeditiously as practicable. In general, DEQ believes that taking corrective action within 24 hours of discovering visible emissions meets the intent of this requirement. However, it is understood that, depending on the circumstances, immediate action or a longer time period may be necessary.

### 7.4 Excess Emissions - IDAPA 58.01.01.130-136

#### ***Requirement***

Facility-wide Condition 2.9 requires the permittee to comply with the requirements of IDAPA 58.01.01.130-136 for startup, shutdown, scheduled maintenance, safety measures, upset, and breakdowns. This section is fairly self-explanatory and no additional detail is necessary in this technical analysis. However, it should be noted that subsections 133.02, 133.03, 134.04, and 134.05 are not specifically included in the permit as applicable requirements. These provisions of the *Rules* only apply if the permittee anticipates requesting consideration under subsection 131.02 of the *Rules* to allow DEQ to determine if an enforcement action to impose penalties is warranted. Section 131.01 states *" . . . The owner or operator of a facility or emissions unit generating excess emissions shall comply with Sections 131, 132, 133.01, 134.01, 134.02, 134.03, 135, and 136, as applicable. If the owner or operator anticipates requesting consideration under Subsection 131.02, then the owner or operator shall also*

*comply with the applicable provisions of Subsections 133.02, 133.03, 134.04, and 134.05.* Failure to prepare or file procedures pursuant to Sections 133.02 and 134.04 is not a violation of the *Rules* in and of itself, as stated in subsections 133.03.a and 134.06.b. Therefore, since the permittee has the option to follow the procedures in Subsections 133.02, 133.03, 134.04, and 134.05; and is not compelled to, the subsections are not considered applicable requirements for the purpose of this permit and are not included as such.

#### ***Compliance Assurance***

The compliance demonstration is contained within the text of Facility-wide Condition 2.9. No further clarification is necessary here.

#### **7.5 Open Burning – IDAPA 58.01.01.600-616**

All open burning shall be done in accordance with IDAPA 58.01.01.600-616.

#### **7.6 Air Stagnation Advisory Days - IDAPA 58.01.01.550**

The Permittee shall comply with the Air Pollution Emergency Rules in IDAPA 58.01.01.550 through 562.

#### **7.7 Monitoring and Recordkeeping - IDAPA 58.01.01.405.01**

The permittee is required to maintain recorded data in an appropriate location for a period of at least five years. Though specific applicable requirements may have record retention times of less than five years, this requirement requires the permittee to maintain all recorded data for a minimum of five years, which will satisfy those shorter record retention times.

#### **7.8 Reports and Certifications- IDAPA 58.01.01.405.01**

All periodic reports and certifications required by the permit shall be submitted within 30 days of the end of each specified reporting period to the appropriate DEQ and EPA regional office.

#### **7.9 Obligation to Comply - IDAPA 58.01.01.406**

Receiving a Tier II operating permit shall not relieve any owner or operator of the responsibility to comply with all applicable local, state, and federal rules and regulations.

#### **7.10 Fuel-Burning Equipment – IDAPA 58.01.01.675**

##### ***Requirement***

Facility-wide Condition 2.15 states that *"The permittee shall not discharge to the atmosphere from any fuel-burning equipment particulate matter in excess of 0.015 grains per dry standard cubic foot (gr/dscf) of effluent gas corrected to 3% oxygen by volume for gas."*

##### ***Compliance Assurance***

Tri-Pro's 7.87 MMBtu/hr boiler is fired by propane. Because the PM emissions from propane combustion are very low, the boiler will not exceed the grain loading standard in Facility-wide Condition 2.15. No monitoring is required for the grain loading standard.

**7.11 Fuel-Sulfur Content – IDAPA 58.01.01.725-729**

***Requirement***

Facility-wide Condition 2.16 states that *"No person shall sell, distribute, use, or make available for use any distillate fuel oil containing more than the following percentages of sulfur:*

*2.16.1 ASTM Grade 1 fuel oil - 0.3% by weight.*

*2.16.2 ASTM Grade 2 fuel oil - 0.5% by weight."*

***Compliance Assurance***

To ensure reasonable compliance with this requirement, Facility-wide Condition 2.17 requires the permittee to maintain documentation of supplier verification of distillate fuel oil content on an as-received basis.

**7.12 Operational Requirements - PTC NO. 017-00006, 12/17/01; IDAPA 58.01.01.405.01; IDAPA 58.01.01.401.01.D**

Tri-Pro ceased the operations of seven dutch oven hogged fuel boilers. Tri-Pro has not operated the Olivine Woodwaste Incinerator and is to use it as a storage silo. The exhaust of No. 6 Trimmer Cyclone has been capped. Emissions from these sources have not been included in the PTE estimations. No modeling analysis was conducted on these sources either. Permit Condition 2.18 imposes an operational requirement to reflect the operating changes.

**7.13 Certification of Documents – IDAPA 58.01.01.123**

The permittee shall comply with all IDAPA 58.01.01.123 requirements for document certification.

**7.14 Renovation/Demolition – 40 CFR 61, Subpart M - Asbestos**

The permittee shall comply with all applicable portions of 40 CFR 61, Subpart M when conducting any renovation or demolition activities at the facility.

**7.15 Process Weight Rate – IDAPA 58.01.01.701**

PM emissions shall not exceed the amount shown in IDAPA 58.01.01.701. IDAPA 58.01.01.701 states that: "No person shall discharge to the atmosphere from any source operating on or after October 1, 1979, particulate matter in excess of the amount shown by the following equations, where E is the allowable emission from the entire source in pounds per hour, and PW is the process weight in pounds per hour:

a. If PW is less than 9,250 pounds per hour,  $E = 0.045(PW)^{0.6}$

b. If PW is equal to or greater than 9,250 pounds per hour,  $E = 1.10(PW)^{0.25}$

The kilns, cyclones, and wood byproducts handling units are subject to process weight rate limitations. Appendix D of this memorandum compares the potential PM emissions to the process weight rate limitations. The process weight emissions limit is not established as an enforceable permit condition because the potential PM emissions are less than the limits established by the process weight equations.

## **Dry Kilns**

### **7.16 Kilns PM<sub>10</sub> And Voc Emissions Limits**

A Dry Kiln emissions limit of 6.84 lb/day for PM<sub>10</sub> is included in the permit to ensure compliance with 24-hr PM<sub>10</sub> NAAQS.

An annual VOC emission limit of 67.5 lb/Yr of Dry Kilns is included in the permit to ensure facility's SM status.

Annual PM<sub>10</sub> emissions from kilns and sawmill are not included in the permit. These emissions are inherently limited by the operating requirements established for daily PM<sub>10</sub> emissions limit and annual VOC emissions limit. The operating requirements to sawmill, kilns, and cyclones ensure the facility maintaining SM status for PM<sub>10</sub>.

Detailed derivation of these emissions limits can be found in Section 6.1 Emissions Estimates and Appendix A of this memorandum. It shows the relationship among emissions limits, sawmill production limit, kilns throughput limit, and kiln physical operating limitation. (i.e. maximum 6,000 hours per year kilns usage)

### **7.17 Compliance Assurance**

Operating requirements for the sawmill and kilns were established to prevent the kilns from exceeding the daily emissions limits, and to keep the facility in SM status. Permit Condition 3.4 states that *"The sawmill shall not produce more than 90 million board feet of lumber per any consecutive 12-month period. The dry kiln shall not dry more than 90 million board feet of green lumber per any consecutive 12-month period."*

Permit Condition 3.5 established monitoring requirement. It states that *"The permittee shall monitor and record the monthly production of both the sawmill and the dry kilns. Each month, the permittee shall record the monthly production of both the sawmill and the dry kilns, and calculate and record the sawmill and dry kiln production for the most recent 12-month period. The most recent five years' compilation of data shall be kept onsite and shall be made available to Department representatives upon request."*

Permit Condition 3.6 establishes a reporting requirement. It states *"The permittee shall report any exceedance of the sawmill and/or dry kilns production limits within five working days of the exceedance."*

No additional monitoring is required for kilns throughput because no off site green lumber is allowed to be shipped to the facility for drying.

## **Cyclones**

### **7.18 Emissions Limits For PM<sub>10</sub>**

Daily emissions limits for PM<sub>10</sub> are included in the permit to ensure compliance with 24-hr PM<sub>10</sub> NAAQS.

Annual cyclone emission rates for PM<sub>10</sub> are not included in the permit. They are inherently limited by the operating requirement established for the daily emissions limits. The operating requirements for the sawmill, kilns and cyclones ensure the facility being SM for PM<sub>10</sub>.

Detailed derivation of these emissions limits can be found in Section 6.1 Emissions Estimates and Appendix A of this memorandum. Appendix A shows the relationship among emissions limits, operating hours and physical operating limitation (i.e. cyclone design capacity in scf/min).

#### **7.19 Compliance Assurance**

An operating requirement for cyclones was established to prevent cyclones from exceeding the daily emissions limits. Permit Condition 4.4 states that *"The maximum duration of operation of the equipment venting to each cyclone shall not exceed 16 hours per calendar day."*

Permit Condition 4.5 establishes a monitoring requirement. It states that *"The permittee shall monitor and record the hours of operation of equipment venting to each cyclone on each calendar day. These records shall be maintained onsite of the most recent five-year period and shall be made available to Department representatives upon request."*

Permit Condition 4.6 establishes a reporting requirement. It states *"The permittee shall report any exceedance of the allowable equipment operation hours within five working days of the exceedance."*

#### ***Wood Byproducts Bins Loadout***

#### **7.20 Emissions Limits**

The emissions estimation from wood byproducts bins loadout can be found in Section 6.1 Emissions Estimation and Appendix A of this memorandum. The emissions are inherently limited by sawmill production limit and kiln throughput limit. No specific emissions limits were included in the permit.

The emissions from bin loadout are fugitive emissions. No modeling analysis was conducted for fugitive emissions. However, the permittee is required in the permit to control and monitor fugitive emissions. Permit Condition 5.2 Fugitive Emissions Monitoring was developed in addition to Facility-wide Conditions 2.1 – 2.4. It states that *"During the first three months after permit issuance, the permittee shall conduct weekly inspections of fugitive emissions while the truck loadout system is operating, during daylight hours, and under normal operating conditions to ensure methods used to reasonably control fugitive emissions are effective. If fugitive emissions are not being reasonably controlled, the permittee shall take corrective action as expeditiously as practicable."*

#### ***Other Sources listed in Table 1.2 of the Permit***

#### **7.21 Emissions Limits**

The emissions from the following sources, which are listed in Table 1.2 of the permit, are either inherently limited by their physical design or by sawmill production limit and kiln throughput limit. No specific emissions limits were included in the permit. However, estimated emissions from these sources can be found in Section 6.1 Emissions Estimation, and Appendix A of this memorandum.

Emissions sources: propane-fired boiler, log yard, debarking, bark hog, sawmill chipper, sawmill screen, planer processes, planer hog, planer screening, sawdust bin loading, chip truck bin loading, shavings track bins loading, fuel bin (silo) shavings loading, and fuel bin hog fuel storage (vertical tank bin) loading.

#### **7.22 NSPS – 40 CFR 60**

No emissions unit at the facility is defined as an affected unit by NSPS requirements.

**7.23 NESHAPS – 40 CFR 61 and 63**

No emissions unit at the facility is defined as an affected unit by NESHAPS requirements.

***Emissions Limits Summary***

**Table 7.1 SUMMARY OF EMISSIONS LIMITS**

Source Description	Emissions Limit	
	DEQ	Tri-Pro
Dry kilns	6.84	67.5
Cyclone No. 1	20.6	----
Cyclone No. 12	30.9	----
Cyclone No. 2 <sup>d</sup>	38.1	----
Cyclone No. 3	47.9	----
Cyclone No. 4	43.2	----
Cyclone No. 5	16.5	----
Cyclone No. 7 <sup>d</sup>	-----	----

<sup>a</sup> As determined by a pollutant-specific EPA reference method, a DEQ-approved alternative, or as determined by DEQ's emissions estimation methods used in this permit analysis.

<sup>b</sup> As determined by multiplying the actual or allowable (if actual is not available) pound per hour emission rate by the allowable hours per year that the process(es) may operate(s), or by actual annual production rates.

<sup>c</sup> Includes condensibles.

<sup>d</sup> Cyclone No. 2 and Cyclone No. 7 do not operate at the same time. The higher pound per day emissions limit is permitted.

***Compliance Issues***

None

## 8. AIRS

Table 8.1 AIRS/AFS FACILITY-WIDE CLASSIFICATION DATA ENTRY FORM

AIR PROGRAM	SIP	PSD	NSPS (Part 60)	NESHAP (Part 61)	MACT (Part 63)	TITLE V	AREA CLASSIFICATION
POLLUTANT							A - Attainment U - Unclassifiable N - Nonattainment
SO <sub>2</sub>	B	NA	NA			B	U
NO <sub>x</sub>	B	"	"			B	U
CO	B	"	"			B	U
PM <sub>10</sub>	SM	"	"			SM	U
PT (Particulate)	SM	"	"			SM	NA
VOC	SM	"	"			SM	U
THAP (Total HAPs)	B	"		NA	NA	B	
			APPLICABLE SUBPART				
			NA	NA	NA		

**AIRS/AFS Classification Codes:**

- A = Actual or potential emissions of a pollutant are above the applicable major source threshold. For NESHAP only, class "A" is applied to each pollutant which is below the 10 ton-per-year (T/yr) threshold, but which contributes to a plant total in excess of 25 T/yr of all NESHAP pollutants.
- SM = Potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable regulations or limitations.
- B = Actual and potential emissions below all applicable major source thresholds.
- C = Class is unknown.
- ND = Major source thresholds are not defined (e.g., radionuclides).
- NA = Not Applicable

## 9. TIER II FEES

Fees apply to this facility in accordance with IDAPA 58.01.01.407. A fee assessment has been prepared for \$10,000 as calculated in Appendix H.

## 10. RECOMMENDATIONS

Based on the review of the application materials, and all applicable state and federal regulations, staff recommends that DEQ issue a Tier II operating permit to Tri-Pro. An opportunity for public comment on the air quality aspects of the proposed operating permit has been provided in accordance with IDAPA 58.01.01.404.01.c., and no comments were received.

## **APPENDIX A**

### **Summary of Emissions Calculations and Assumptions (Spreadsheet)**

Tri-Pro Cedar Products, Inc.

Emissions Source	Max. or permitted annual production rate	Unit	PM <sub>10</sub> (for cyclones operated 16 hrs/day, 5,640 hr/yr)		SO <sub>2</sub>		NO <sub>x</sub>		CO		VOC		Methanol		Formaldehyde		Notes	
			lb/yr	T/yr	lb/day	lb/yr	T/yr	lb/yr	T/yr	lb/yr	T/yr	lb/yr	T/yr	lb/yr	T/yr	lb/yr		T/yr
Boiler	7.87	heat input MMBtu/hr	0.03	0.15		0.04	0.16	1.20	5.27	0.16	0.72	0.03	0.11					EFs for PM <sub>10</sub> , NO <sub>x</sub> , VOC, and CO were taken from AP-42 table 1.9 1, rev. 10/96. SO <sub>2</sub> EF of 0.435 lb/1000 gal was provided by Tri-Pro on their 12/05/02 submittal
Olive Woodwaste Incinerator (disabled)						27.9	48.8	9.4	15.8	37.6	62.4	1	1.8					
Debarking (fugitive)	270,000	Tons log	0.34	1.49														debarking sawing factor: 0.024 lb/T of logs for PM, and 0.011 lb/T of logs for PM <sub>10</sub>
Bark Hog (fugitive)	25,506	Tons bark	0.58	2.55														using log sawing emissions factor: 0.35 lb/T for PM, and 0.2 lb/T for PM <sub>10</sub>
Sawmill (sawing)	270,000	Tons log	0.06	0.27														99% control, indoor with pneumatic dust pickup
Sawmill Screen	35,280	Tons of chips	0.02	0.09														DEQ target box PM <sub>10</sub> EF of 0.05 lb/T with 90% building control
Sawmill Chipper	35,280	Tons of chips	0.08	0.35														Similar to sawing logs, using log sawing emissions factor: 0.35 lb/T for PM, and 0.2 lb/T for PM <sub>10</sub> . 90% building control
Lumber Drying Kilns	90,000	1,000 board feet	0.285	0.86								22.50	67.5	0.24	1.04	0.01	0.05	1) The IDEQ EFs 0.33 lb/1,000 board feet for PM and 0.19 lb/1,000 board feet for PM <sub>10</sub> were used to estimate the emissions; 2) 90% control efficiency was applied to PM and PM <sub>10</sub> due to being electronic dehumidification kilns; 3) supporting information for EFs for Methanol and Formaldehyde was provided on 7/24/02 4) kilns would dry lumber for 6,000 hours per year during peak operation.
Planer Hog	10,800	Tons of chips	0.25	1.08														Similar to sawing logs, EF of 0.35 lb/T for PM and 0.2 lb/T for PM <sub>10</sub> for log sawing was used to re-estimate the emissions
Planer Chipper Screen	10,800	Tons of chips	0.01	0.03														DEQ target box PM <sub>10</sub> EF of 0.05 lb/T with 90% building control
Fuel Bin Cyclone #1	20,000 ton max. shavings, 25,506 ton max. bark																	
	10,000	scf/min	1.29	3.76	20.6													0.03 gr/scf for PM and 0.015 gr/scf for PM <sub>10</sub>
Shavings Bin Cyclone #2 (operates alternately with Shavings Bin Cyclone #7)	20,000	Tons of shavings																
	18,500	scf/min	2.38	6.95	38.1													0.03 gr/scf for PM and 0.015 gr/scf for PM <sub>10</sub>
	20,000	Tons of shavings																
Planer Shavings Cyclone #3	23,276	scf/min	2.99	8.74	47.9													0.03 gr/scf for PM and 0.015 gr/scf for PM <sub>10</sub>
	26,000	scf/min																
Trimmer Bin Cyclone #4	20,000	Tons of shavings																
	21,000	scf/min	2.70	7.88	43.2													0.03 gr/scf for PM and 0.015 gr/scf for PM <sub>10</sub>
Planer Chipper Cyclone #5	10,800	Tons of chips																DEQ staff used 0.03 gr/scf for PM and 0.015 gr/scf for PM <sub>10</sub> to re-estimate the emissions.
	8,000	scf/min	1.93	3.00	16.5													
	20,000	Tons of shavings																
Trimmer Cyclone #6	5,000	scf/min	0.00	0.00	0.0													Trimmer Cyclone #6 exhaust is capped/closed per Tri-Pro 12/5/02 submittal
Shavings Bin Cyclone #7 (operates alternately with Shavings Bin Cyclone #2)	20,000	Tons of Shavings																Modeled DEQ #2, the bigger one between #2 and #7.
	7,200	scf/min	0.93	2.70	14.8													0.03 gr/scf for PM and 0.015 gr/scf for PM <sub>10</sub>
	25,506	tons of bark																
Bark Cyclone #12	15,000	scf/min	1.93	5.83	30.9													DEQ staff used 0.03 gr/scf for PM and 0.015 gr/scf for PM <sub>10</sub> to re-estimate the emissions, same as the method used in the existing PTC.
Fuel Bin (Hog Fuel Storage) loading	25,506	Tons hog fuel	1.66	7.40														Using EF of 1.0 lb/T handled for bin venting for PM, and 0.58 lb/T for PM <sub>10</sub>

Emissions Source	Max. or permitted annual production rate		PM <sub>10</sub> (for cyclones operated 16 hrs/day, 5,840 hr/yr)		SO <sub>2</sub>		NO <sub>x</sub>		CO		VOC		Methanol		Formaldehyde		Notes	
	Unit		lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr		
Fuel Bin (Hog Fuel Storage) loadout (fugitive)	25,500	Tons hog fuel	1.05	4.60													EFs for sawdust handling 1.0 lb/T for PM and 0.36 lb/T for PM <sub>10</sub> were used to re-estimate emissions from Truck Bin Loadout. DEQ staff observed truck bin loadout at a sawmill and decided that the emissions from truck bin loadout are more similar to sawdust handling.	
Sawdust Bin Loading	21,168	Tons sawdust	1.40	6.14													Using EF of 1.0 lb/T handled for bin venting for PM, and 0.58 lb/T for PM <sub>10</sub> .	
Sawdust Bin Truck Loadout (fugitive)	21,168	Tons sawdust	0.87	3.81													EFs for sawdust handling 1.0 lb/T for PM and 0.36 lb/T for PM <sub>10</sub> were used to re-estimate emissions from Truck Bin Loadout. DEQ staff observed truck bin loadout at a sawmill and decided that the emissions from truck bin loadout are more similar to sawdust handling.	
Chip Bin Loading (w/ target box)	35,280	Tons of chips	0.05	0.23													Using EF of 0.1 lb/bondry ton for PM and 0.05 lb/bondry ton for PM <sub>10</sub> for a bin with target box.	
Chip Bin (chips from sawmill) Loadout (fugitive)	35,280	Tons of chips	1.45	6.35													EFs for sawdust handling 1.0 lb/T for PM and 0.36 lb/T for PM <sub>10</sub> were used to re-estimate emissions from Truck Bin Loadout. These two processes are similar.	
#5 Planer Chipper Cyclone directly loadout to truck (fugitive)	10,800	Tons of chips	0.44	1.94													EFs for sawdust handling 1.0 lb/T for PM and 0.36 lb/T for PM <sub>10</sub> were used to re-estimate emissions from Truck Bin Loadout. DEQ staff observed truck bin loadout at a sawmill and decided that the emissions from truck bin loadout are more similar to sawdust handling.	
Shavings Truck Bins Loading (App.E Plant Flow Diagram)	20,000	Tons of shavings	1.32	5.80													Using EF of 1.0 lb/T handled for bin venting for PM, and 0.58 lb/T for PM <sub>10</sub> .	
Shavings Truck Bins Loadout (fugitive)	20,000	Tons of Shavings	0.41	1.8													EFs for sawdust handling 1.0 lb/T for PM and 0.36 lb/T for PM <sub>10</sub> were used to re-estimate emissions from Truck Bin Loadout. DEQ staff observed truck bin loadout at a sawmill and decided that the emissions from truck bin loadout are more similar to sawdust handling. 50% control efficiency applies because loadout areas are sheltered on the sides by wooden walls.	
Mobile Sources Fugitive Dust - UNPAVED (fugitive)			0.08	0.33														
Mobile Sources Fugitive Dust - PAVED (fugitive)			0.06	0.26														
Fugitive Total																		
Total				81.47			48.96		20.87		63.12		69.21		1.04		0.05	The total emissions excludes emissions from cyclones #7 and #8
PTE for Applicability Purpose (without Olive Woodwaste Incinerator)				58.35														Emissions from the fugitive sources were not included to determine PTE for applicability purpose. By excluding the emissions from Olive Woodwaste Incinerator and fugitive sources and with the operating limits, PM <sub>10</sub> emissions are less than 100 T/yr. Therefore, the facility qualifies as an SM facility.
																		Emissions from fuel bin shavings loadout are included in Shavings Truck Bins and Fuel Bin Hog Fuel Storage Loadout emissions estimation.

## **APPENDIX B**

- Emissions Estimation for SO<sub>x</sub> Emitted from Propane-Fired Boiler
- Dehumidification Dry Kiln and Tri-Pro Kilns

emissions control plan.

**Responses to August 5, 2002 letter from Shawnee Chen to Steve Linton  
(Attachment B):**

1. Tri-Pro does not have emergency generators (verified 11-15-02).
2. Propane sulfur-content data is not readily available to the facility. Data was obtained from the refinery for this analysis, but it is not provided with the propane shipments. Therefore, Tri-Pro requests that Tier II permit contain no conditions requiring monitoring or reporting of the sulfur content of propane.

The refinery data shows that the sulfur content of the propane is 71 parts per million, mole basis (ppmvd). Typical propane high heating value (HHV) information has been obtained from the Santa Barbara County Air Pollution Control District (SBAPCD) Engineering Division, application processing and calculations guidance for SO<sub>x</sub> emission factors for gaseous fuels. Using the calculations provided by SBAPCD, the SO<sub>2</sub> emission factor is estimated as follows:

$$\begin{aligned} \text{EF (lb/mmBtu)} &= 0.169 * \text{S/HHV} = 0.169 * 71 / 2,522 = 0.005 \text{ lb/mmBtu} \\ 0.005 \text{ lb/mmBtu} * 91.5 \text{ mmBtu/1000 gallons} &= 0.435 \text{ lb/1000 gallons} \end{aligned}$$

EF = SO<sub>2</sub> emission factor in lb/mmBtu

S = sulfur content, 71 ppmvd

HHV = fuel high heating value, typically 2,522 Btu/scf for propane (SBAPCD)

Maximum Hourly Emissions:	$0.435 \text{ lb/1000 gallon} * 86 \text{ gallons/hr} = 0.037 \text{ lb/hr}$
Typical Annual Emissions:	$0.037 \text{ lb/hr} * 3,500 \text{ hr/yr} / (2000 \text{ lb/t}) = 0.066 \text{ tpy}$
Maximum Annual Emissions:	$0.037 \text{ lb/hr} * 8,760 \text{ hr/yr} / (2000 \text{ lb/t}) = 0.16 \text{ tpy}$

The new emission estimates have been used in the model.

USFS  
WAS Site

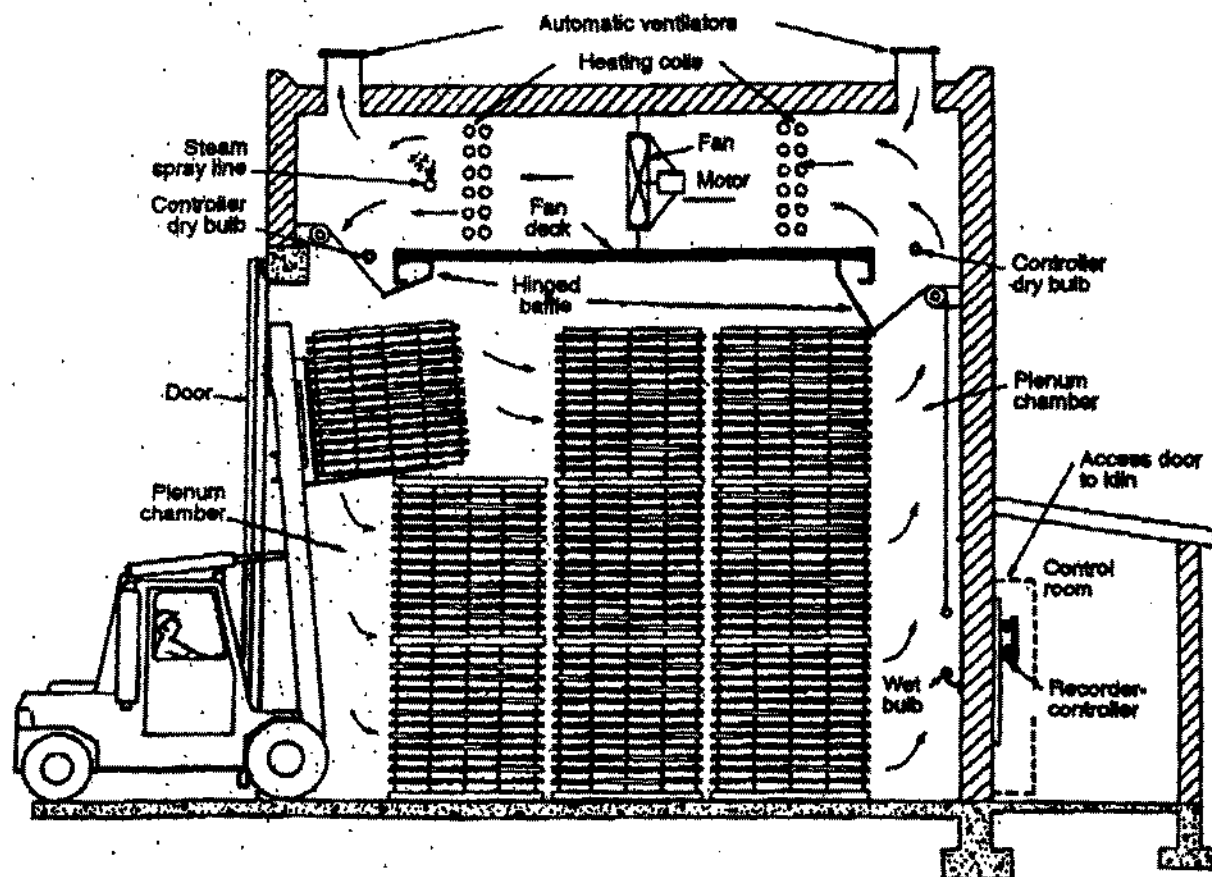


Figure 7.2—A typical package-type dry kiln for hardwood lumber.

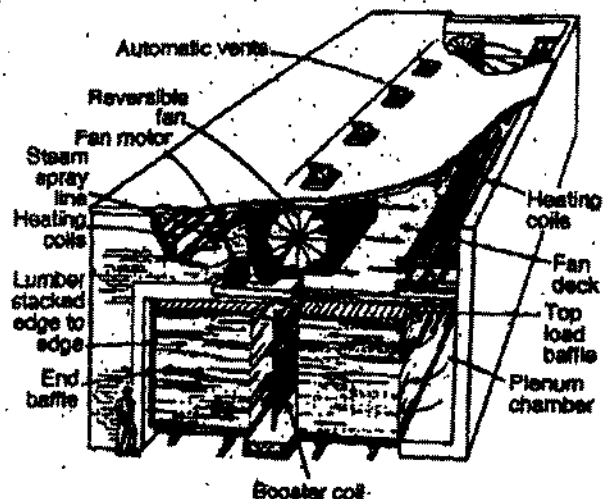


Figure 7.3—A typical track-type dry kiln for hardwood lumber.

## Dehumidification Drying

Although most hardwood dry kilns are steam heated, many kilns use electricity, especially dehumidifier-type kilns, and a few kilns are heated by hot water. Direct fired kilns, for which hot exhaust gases from the burner enter the kiln directly, and kilns that use a hot-air plenum chamber between the kiln and the burner are not popular in North America for quality hardwood lumber drying. (Direct fired systems are popular for drying Southern Pine construction lumber.) If modern kiln designs and construction techniques are used and if the equipment is working properly and achieves the required temperature, humidity, and velocity, drying quality will depend on the operating procedures and not the basic type of equipment. Lumber drying quality is determined by the temperature, RH, and velocity used during the drying process.

Dehumidification drying is an attractive method because it can produce very high quality drying with a small capital investment. Furthermore, drying times are similar to those used for steam kilns. For a small to medium operation

(<2 million board feet/year), the dehumidification kiln almost always proves to be the most economical method of drying. If electrical rates are low (under \$0.07/kWh), even larger operations can be economical. Typical internal rates of return, after taxes, exceed 12% when the value added to lumber by drying exceeds \$200/thousand board feet.

Electric dehumidifiers have become a good way to dry lumber at temperatures up to 150°F (66°C); final MC values can be as low as 6% if required. Electric dehumidifier temperatures kill insects and their eggs. The quality of lumber dried in a properly operated dehumidification kiln is as good as that dried in a properly operated steam kiln.

The dehumidifier kiln is essentially a closed structure in which water is removed from the atmosphere in the kiln by passing warm, moist air across cold coils. The moisture in this air is condensed into liquid. When vapor is condensed, it releases about 1,000 Btu/lb (2.3 kJ/g) of condensed water, which is then used to heat the dehumidified air before it passes back into the kiln. The energy in the dehumidified, heated air is then used to evaporate more water from the lumber, and the cycle continues. When oak is dried in a dehumidification kiln, the condensed water used to heat the dehumidified air has a pH of around 3.4. The characteristics of this condensed water are described in detail by Solliday and others (1999). For new dehumidification installations, check with State water control officials for up-to-date requirements for water disposal and treatment.

Because dehumidification represents only a difference in type of energy, not in type of hardware, the dehumidification drying process is identical to that used in a steam kiln. A dehumidification kiln uses approximately 300 to 500 kWh (1,100 to 1,800 MJ) per thousand board feet of electrical energy to remove moisture from the kiln atmosphere, whereas a steam kiln uses venting. A dehumidification kiln recycles the heat of evaporation, whereas a steam kiln vents this potential energy. In dehumidification drying, the lumber does develop normal "casehardening" stresses, which must be removed if the wood will be resawn, ripped, or heavily machined. Normal equalizing is also required. Efficient equalizing and conditioning can be accomplished with a small boiler. Water spray systems can also be very effective in some situations.

The dehumidification compressor must be properly sized for the job. As a rule of thumb, approximately 1 hp (735 W) compressor power is required for every thousand board feet to be dried. A smaller compressor can be used if the wood is a slow drying species or is thick. If the wood is a fast drying species, such as most softwoods and most low density hardwoods, then compressor power must be more than 2 hp (1,500 W) per thousand board feet. If the compressor is too small, drying times will be prolonged and the risk of staining will be high. If the compressor is too large, it will cycle on and off frequently, which will shorten its service life, but no lumber damage will be incurred if the controls are working properly. Most compressors require a kiln temperature of at

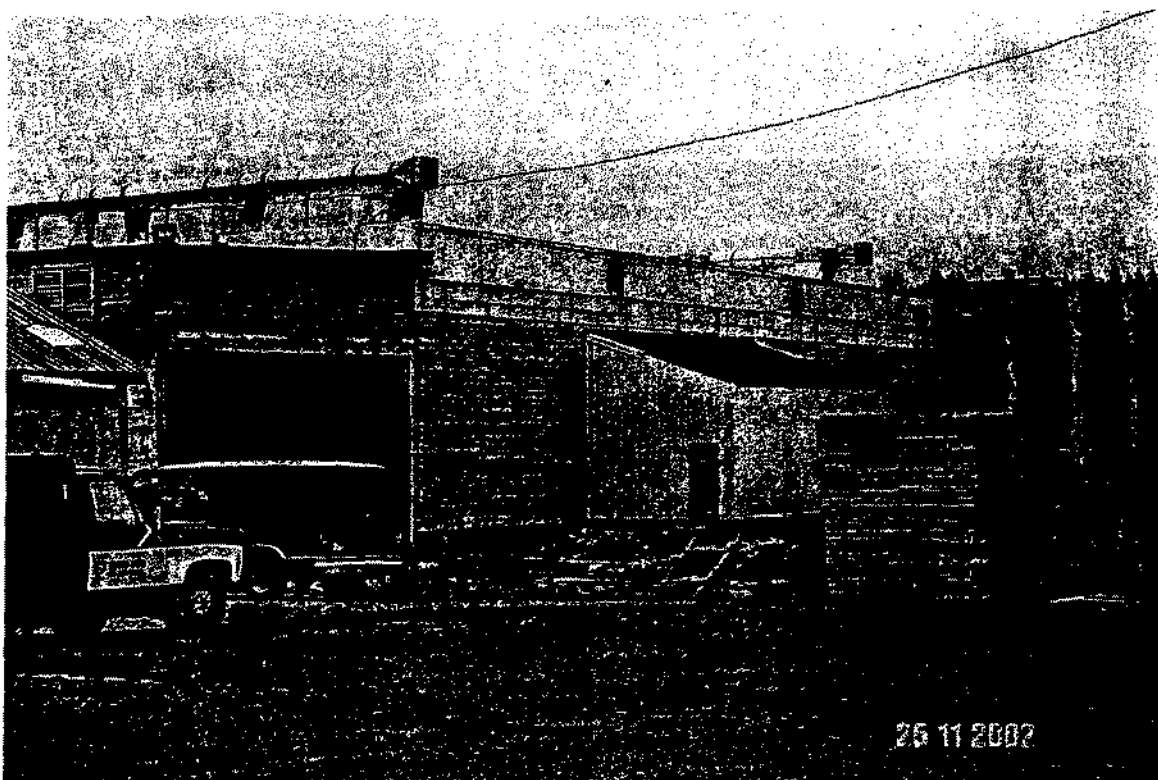
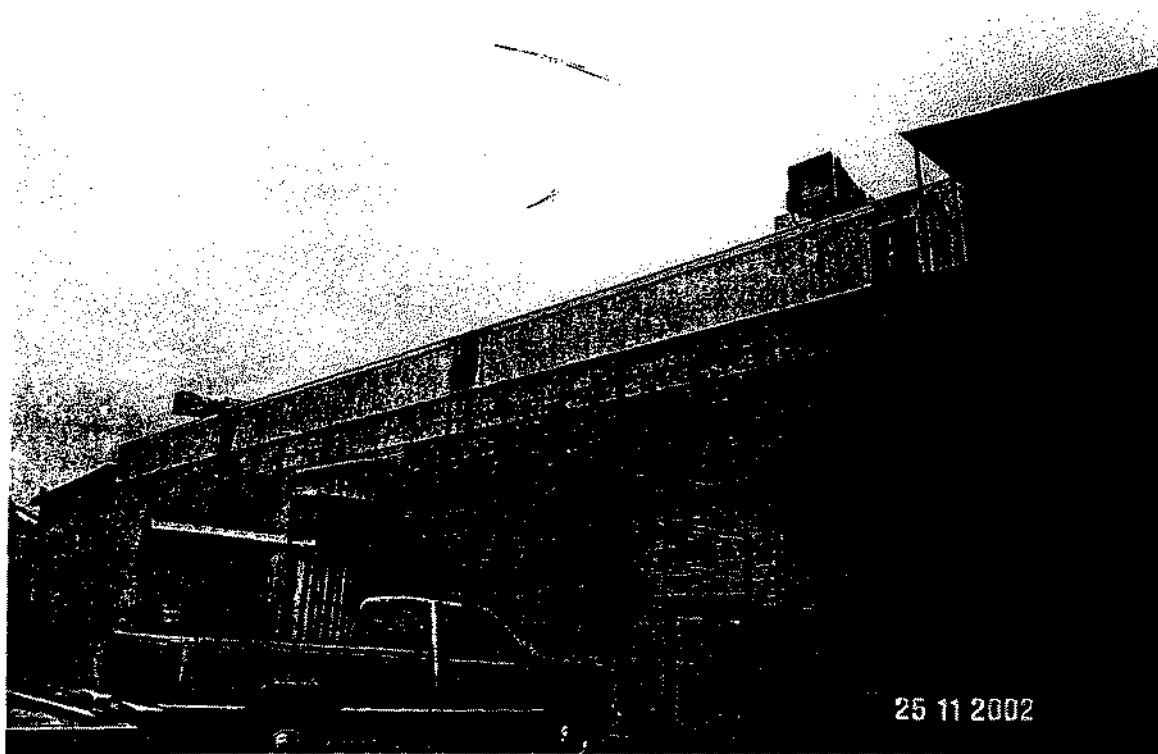
least 85°F (29°C) before they can be turned on. If the lumber is cold when it enters the kiln, it is wise to consider an auxiliary heating source for the initial start-up. Electric heaters can be used, but they are expensive.

When the kiln should circulate the air through the load at about 350 ft/min (1.8 m/s). Higher velocities can be used for fast drying species, but the cost of increasing air speed is quite high and may not be justified. For slightly underpowered dehumidification units, it is advisable to load the kiln initially 50% full and operate it for a day before adding the rest of the load. This procedure provides for better color control and prevents the growth of mold. High quality kiln controls are essential. These controls both record and control kiln temperature and RH (or wet-bulb depression, wet-bulb temperature, or EMC). The controls also automatically reverse fan direction every several hours.

In nearly all cases, the kiln schedule used with a dehumidification kiln incorporates a lower initial dry-bulb temperature than that used in the standard steam schedule. The lower initial dry-bulb temperature, although not necessary if there is sufficient heat in the dehumidification dryer, results from the fact that the compressor can begin working at 85°F (29°C); steam kilns cannot work well under 105°F (41°C). However, cooler temperatures often enhance lumber quality. At the end of the drying cycle, most dehumidification kilns achieve 150°F (66°C) maximum temperature ~~because of the limits imposed by operating temperatures of the compressor.~~ The RH specified by the dehumidification kiln schedule is usually identical to that for the steam kiln schedule. In most cases, the velocity in the dehumidification kiln is a minimum of 350 ft/min (1.8 m/s) through the load, which is similar to that used in many steam kilns. Higher velocities are beneficial for fast drying species.

The building that houses the dehumidification kiln is similar to that used for a steam kiln. However, because heat losses are expensive when electric energy is used, good insulation is more critical for a dehumidification kiln building than for a steam kiln building. Many dehumidification buildings are wood frame (2 by 10) structures with 28 in. (2203 mm) of insulation. The walls are covered with C-C grade exterior plywood. A conventional plastic vapor barrier is placed behind the interior plywood; the interior plywood may also be painted with a commercial kiln coating. The exterior wall must not be coated with anything that will inhibit moisture removal from inside the walls. Standard kiln safety features must be followed, including those that govern exit doors, lighting, electrical lock-outs, and so on.

The total energy used in dehumidification is 50% or less of that used in a conventional steam kiln. This benefit is partially offset by the higher cost of electricity compared with the cost of steam energy. However, with the support of various government and power company incentives, the cost of dehumidification drying is competitive with that of steam-heated drying.



Photos 3 and 4: Dry Kilns, with two exhaust vents on top.

## APPENDIX C

Idaho DEQ Emission Factor Guide for Wood industry, Attachment B



## ATTACHMENT B

## Idaho DEQ Emission Factor Guide for Wood Industry

11/99 R  
- 01/99

Process Equipment	Description	Units	Pounds PM	Pollutant PM-10	Per SOx	Unit NOx	Thruput CO	VOC	PM/PM-10 Adj. Factor	For Condition
Log Debarking	Uncontrolled Emis.	Tons of logs	0.024	0.011	--	--	--	--	--	--
Sawing Logs	Uncontrolled Emis.	Tons of Logs	0.35	0.2	--	--	--	--	0.4-1.0**	55-25% H2O in log
Sawdust Pile	Uncontrolled Emis.	Tons Handled	1.0	0.38	--	--	--	--	0.4-1.0	50-25% H2O in pile
Lumber Drying Kilns	Uncontrolled Emis.	M Board Feet	0.33	0.19	--	--	--	1.50	--	--
Cyclone Exhaust	Dry & Green Chips,	Bonedry Tons	0.5	0.25 (both for Medium Efficiency)*	--	--	--	--	--	--
	Shavings, Hugged	Bonedry Tons	0.2	0.16 (both for High Efficiency)*	--	--	--	--	--	--
	Fuel/Bark, Green	Bonedry Tons	0.001	0.001 (with Baghouse)	--	--	--	--	--	--
	Sawdust.									
	Mill Mix	(grains/scf Air)	0.03	0.015 (both for Medium Efficiency)*	--	--	--	--	0.4-1.0***	50-25% H2O in Mix
	Mill Mix	(grains/scf Air)	0.015	0.011 (both for High Efficiency)*	--	--	--	--	0.4-1.0***	50-25% H2O in Mix
	Mill Mix	(grains/scf Air)	0.001	0.001 (with Baghouse)	--	--	--	--	0.4-1.0***	50-25% H2O in Mix
	Sanderdust	Bonedry Tons	2.0	1.6 (both-- for High Efficiency)*	--	--	--	--	--	--
	Sanderdust	Bonedry Tons	0.04	0.04 (with Baghouse)	--	--	--	--	--	--
	Sanderdust	(grains/scf Air)	0.055	0.028 (both for Medium Efficiency)*	--	--	--	--	0.65-1.0***	50-25% H2O in Mix
Cyclone Exhaust	Sanderdust	(grains/scf Air)	0.025	0.02 (both for High Efficiency)*	--	--	--	--	0.65-1.0***	50-25% H2O in Mix
	Sanderdust	(grains/scf Air)	0.001	0.001 (with Baghouse)	--	--	--	--	0.65-1.0***	50-25% H2O in Mix
	Sanderdust	(grains/scf Air)	0.001	0.001 (with Baghouse)	--	--	--	--	0.65-1.0***	50-25% H2O in Mix
Target Box	Medium Efficiency	Bonedry Tons	0.1	0.05	--	--	--	--	--	--
Waste Wood	Bin Venting	Tons Handled	1.0	0.58	--	--	--	--	0.4-1.0	50-25% H2O cont
	Bin Unloading	Tons Handled	2.0	1.2	--	--	--	--	0.4-1.0	50-25% H2O cont

c:\data\lotus\woodfacr.wk1

1. EPA 450/4-90-003, March 1990, "AIRs Facility Subsystem Source Classification Codes and Emission Factor Listing for Criteria Pollutants."
2. AP-42, dated February 1980.
3. Oregon DEQ/AQ Permitting and Inspection Manual, November 1993.
4. Gullian, R. and Washington, E., ET Report 1/20 and 1/25/92 by Environmental Measurement, Flagstaff, AZ, 1992.
5. AP-42, dated January 1995.

\* Efficiency range determined per C. E. Lapple equations (Air Pollution Control by C.D Cooper and F. C. Alley; Chapter 4).

\*\* Consider also whether operation is inside and how well enclosed.

\*\*\* Mill Mix is less dry and more coarse than Sander Dust.

## APPENDIX D

### Process Weight Rate Calculation (Spreadsheet)

Tri-Pro Cedar Products, Inc.						
Emissions Unit	Max. Production Rate		PW lb/hr	Process weight rate limitation, PM lb/hr	PTE, PM (16 hr/day or 5,840 hr/yr for Cyclones)	
	Unit				lb/hr	T/yr
Boiler	7.87	heat input MMBtu/hr	not applicable		0.03	0.15
Olivine Woodwaste Incinerator (disabled)						
Debarking (fugitive)	270,000	Tons log	61,644	17.33	0.74	3.24
Bark Hog (fugitive)	25,506	Tons bark	5,823	8.17	1.02	4.46
Sawmill (sawing)	270,000	Tons log	61,644	17.33	0.11	0.47
Sawmill Screen	35,280	Tons of chips	8,055	9.93	0.04	0.18
Sawmill Chipper	35,280	Tons of chips	8,055	9.93	0.14	0.62
Lumber Drying Kilns	90,000	1,000 board feet	25,796	13.94	0.495	1.49
Planer Hog	10,800	Tons of chips	2,466	4.88	0.43	1.89
Planer Chipper Screen	10,800	Tons of chips	2,466	4.88	0.01	0.05
Fuel Bin Cyclone #1	20,000 max. shavings, 25,506 max. bark		4,566			
Shavings Bin Cyclone #2 (operates alternately with another Shavings Bin Cyclone #7)	10,000 scf/min			7.06	2.57	7.51
Planer Shavings Cyclone #3	20,000 Tons of Shavings		4,566			
	18,500 scf/min			7.06	4.76	13.89

EFs for PM<sub>10</sub>, NO<sub>x</sub>, VOC and CO were taken from AP-42 table 1.5-1, rev. 10/96. SO<sub>2</sub> EF of 0.435 lb/1000 gal was provided by Tri-Pro on their 12/05/02 submittal

Debarking sawing factor: 0.024 lb/T of logs for PM, and 0.011 lb/T of logs for PM<sub>10</sub>.

using log sawing emissions factor. 0.35 lb/T for PM, and 0.2 lb/T for PM<sub>10</sub>.

99% control, indoor with pneumatic dust pickup  
DEQ target box EF of 0.1 lb/T for PM and EF of 0.05 lb/T for PM<sub>10</sub> with 90% building control based on Tri-pro site observation/application

Similar to sawing logs. using log sawing emissions factor. 0.35 lb/T for PM, and 0.2 lb/T for PM<sub>10</sub>. 90% building control

1) The IDEQ EFs 0.33 lb/1,000 board feet for PM and 0.19 lb/1,000 board feet for PM<sub>10</sub> were used to estimate the emissions; 2) 90% control efficiency was applied due to being electronic dehumidification kilns; 3) supporting information for EFs for Methanol and Formaldehyde was provided on 7/24/02 4) 2 X 4 western redcedar green lumber 50% moisture with density of 29.6 lb/ft<sup>3</sup>, surfaced green actual cubic content of 58.1 ft<sup>3</sup>/MBF "Conversion Factors for the Pacific Northwest Forest Industry" 4) kilns would dry lumber for 6,000 hours per year during peak operation.

Similar to sawing logs. EF of 0.35 lb/T for PM and 0.2 lb/T for PM<sub>10</sub> for log sawing was used to re-estimate the emissions

DEQ target box EF of 0.1 lb/T for PM and EF of 0.05 lb/T for PM<sub>10</sub> with 90% building control based on Tri-pro site observation/application

0.03 gr/dscf for PM and 0.015 gr/dscf for PM<sub>10</sub>

0.03 gr/dscf for PM and 0.015 gr/dscf for PM<sub>10</sub>

0.03 gr/dscf for PM and 0.015 gr/dscf for PM<sub>10</sub>

0.03 gr/dscf for PM and 0.015 gr/dscf for PM<sub>10</sub>

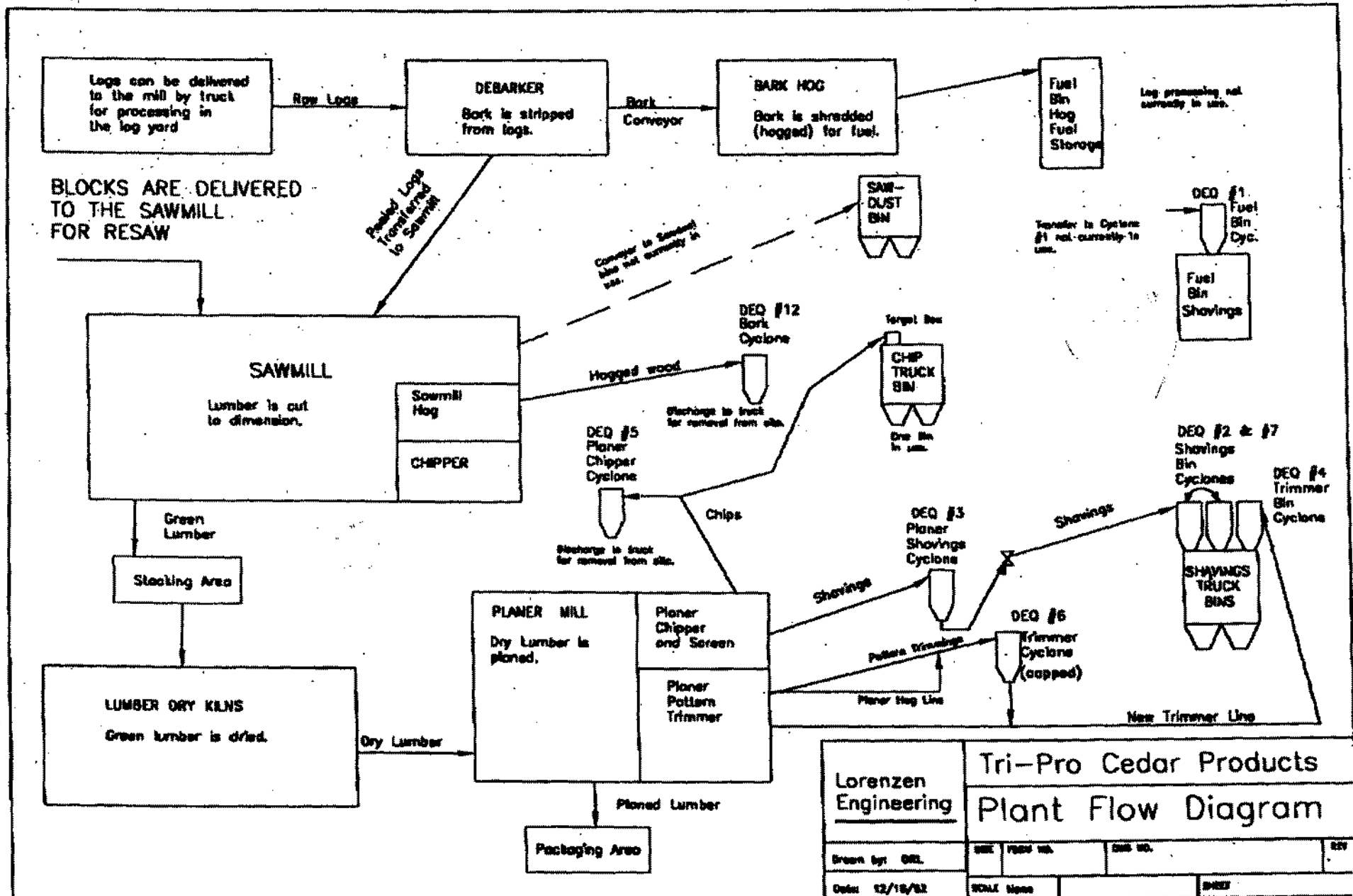
0.03 gr/dscf for PM and 0.015 gr/dscf for PM<sub>10</sub>

Emissions Unit	Max. Production Rate		PW	Process weight rate limitation, PM	PTE, PM (16 hr/day or 5,840 hr/yr for Cyclones)		Comments
	Unit	Unit			lb/hr	T/yr	
	23,276	scf/min		7.06	5.99	17.48	0.03 gr/dscf for PM and 0.015 gr/dscf for PM <sub>10</sub>
	25,000	acfm					
Trimmer Bin Cyclone #4	20,000	Tons of Shavings	4,566				
	21,000	scf/min		7.06	5.40	15.77	0.03 gr/dscf for PM and 0.015 gr/dscf for PM <sub>10</sub>
Planer Chipper Cyclone #5	10,800	Tons of chips	2,466				DEQ staff used 0.03 gr/scf for PM and 0.015 gr/scf for PM <sub>10</sub> to re-estimate the emissions.
	8,000	scf/min		4.88	2.06	6.01	0.03 gr/dscf for PM and 0.015 gr/dscf for PM <sub>10</sub>
	20,000	Tons of Shavings	4,566				
Trimmer Cyclone #6	8,000	scf/min		7.06	2.06	6.01	Trimmer Cyclone #6 exhaust capped per Tri-Pro 12/5/02 submittal
Shavings Bin Cyclone #7 (operates alternately with Shavings Bin Cyclone #2)	20,000	Tons of Shavings	4,566				Modeled #2 cyclone, the larger one between #2 and #7.
	7,200	scf/min		7.06	1.85	5.41	
	25,506	tons of hogged wood	5,823				
Bark Cyclone #12	15,000	scf/min		8.17	3.86	11.26	DEQ staff used 0.03 gr/scf for PM and 0.015 gr/scf for PM <sub>10</sub> to re-estimate the emissions, same as the method used in the existing PTC.
Fuel Bin (Hog Fuel Storage) loading	25,506	Tons hog fuel	5,823	8.17	2.91	12.75	Using EF of 1.0 lb/T handled for bin venting for PM, and 0.58 lb/T for PM <sub>10</sub> .
Fuel Bin (Hog Fuel Storage) loadout (fugitive)	25,506	Tons hog fuel	5,823	8.17	2.91	12.75	EFs for sawdust handling 1.0 lb/T for PM and 0.36 lb/T for PM <sub>10</sub> were used to re-estimate emissions from Truck Bin Loadout. DEQ staff observed truck bin loadout at a sawmill and decided that the emissions from truck bin loadout are more similar to sawdust handling.
Sawdust Bin Loading	21,168	Tons sawdust	4,833	7.31	2.42	10.58	Using EF of 1.0 lb/T handled for bin venting for PM, and 0.58 lb/T for PM <sub>10</sub> .
Sawdust Bin Truck Loadout (fugitive)	21,168	Tons sawdust	4,833	7.31	2.42	10.58	EFs for sawdust handling 1.0 lb/T for PM and 0.36 lb/T for PM <sub>10</sub> were used to re-estimate emissions from Truck Bin Loadout. DEQ staff observed truck bin loadout at a sawmill and decided that the emissions from truck bin loadout are more similar to sawdust handling.
Chip Bin Loading (w/ target box)	35,280	Tons of chips	8,055	9.93	1.05	4.59	Using EF of 0.1 lb/bondry ton for PM and 0.05 lb/bondry ton for PM <sub>10</sub> for a bin with target box
Chip Bin (chips from sawmill) Loadout (fugitive)	35,280	Tons of chips	8,055	9.93	4.03	17.64	EFs for sawdust handling 1.0 lb/T for PM and 0.36 lb/T for PM <sub>10</sub> were used to re-estimate emissions from Truck Bin Loadout. These two processes are similar.

Emissions Unit	Max. Production Rate		PW lb/hr	Process weight rate limitation, PM lb/hr	PTE, PM (16 hr/day or 5,840 hr/yr for Cyclones)		Comments
	Unit				lb/hr	T/yr	
#5 Planer Chipper Cyclone directly loadout to truck (fugitive)	10,800	Tons of chips	2,466	4.88	1.23	5.40	EFs for sawdust handling 1.0 lb/T for PM and 0.36 lb/T for PM <sub>10</sub> were used to re-estimate emissions from Truck Bin Loadout. DEQ staff observed truck bin loadout at a sawmill and decided that the emissions from truck bin loadout are more similar to sawdust handling.
Shavings Truck Bins Loading (App.A Plant Flow Diagram)	20,000	tons of Shavings	4,566	7.06	2.28	10.00	Using EF of 1.0 lb/T handled for bin venting for PM, and 0.58 lb/T for PM <sub>10</sub> .
Shavings Truck Bins Loadout (fugitive)	20,000	Tons of Shavings	4,566	7.06	1.14	5	EFs for sawdust handling 1.0 lb/T for PM and 0.36 lb/T for PM <sub>10</sub> were used to re-estimate emissions from Truck Bin Loadout. DEQ staff observed truck bin loadout at a sawmill and decided that the emissions from truck bin loadout are more similar to sawdust handling. 50% control efficiency applies because loadout areas are sheltered on the sides by wooden walls.
Mobile Sources Fugitive Dust - UNPAVED (fugitive)			not apply		0.08	0.33	
Mobile Sources Fugitive Dust - PAVED (fugitive)			not apply		0.06	0.26	
Fugitive Total							
Total						174.36	
PTE for Applicability Purpose (without Olivine Woodwaste Incinerator)						108.68	Emissions from the fugitive sources were not included to determine PTE for applicability purpose. By excluding the emissions from Olivine Woodwaste Incinerator and fugitive sources, PM <sub>10</sub> emissions are less than 100 T/yr. Therefore, the facility qualifies as an SM facility.
							Emissions from Fuel Bin Shavings Loadout are included in Shavings Truck Bins and Fuel Bin Hog Fuel Storage Loadout emissions estimation.

# APPENDIX E

## Plant Flow Diagram



# APPENDIX F

## AIRS Data Entry Sheet

No changes to existing emissions units

# ABBREVIATED AIRS DATA ENTRY SHEET

Name of Facility: Tri-Pro Cedar Products, Inc.

AIRS/Permit #: 017-00006

Permit Issue Date: \_\_\_\_\_

\*Source/Emissions Unit Name (25 spcs)

(Please use name as indicated in permit)

SCC #

(8 digit #)

## Air Program

(SIP/NESHAP/  
NSPS/PSD/  
MACT)

\* No change

[illegible]

# APPENDIX G

## Modeling Memorandum

## **MEMORANDUM**

**TO:** Shawnee Chen, Engineer Technical I, State Office of Technical Services  
Mary Anderson, Air Modeling Coordinator, Air Program Division

**FROM:** Kevin Schilling, Air Quality Scientist, State Office of Technical Services

**SUBJECT:** Modeling review for Tri-Pro Cedar Products, Inc., Tier II application; Oldtown, Idaho, facility

**DATE:** March 1, 2003

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### **1. SUMMARY:**

Tri-Pro Cedar Products, Inc. (Tri-Pro) submitted a Tier II operating permit application for their Sawmill and Planing Mill located in Oldtown, Idaho. Atmospheric dispersion modeling of facility-wide emissions were submitted with the Tier II operating permit application to demonstrate that emissions from the facility would not cause or significantly contribute to a violation of an ambient air quality standard, as required by IDAPA 58.01.01.403.02.

### **2. DISCUSSION:**

This section describes the regulatory modeling requirements and the methodology used for the analyses performed.

#### **2.1 Introduction and Regulatory Requirements for Modeling**

A review of atmospheric dispersion modeling of the Tri-Pro facility was conducted in support of issuing a Tier II operating permit for operations at their facility located at Oldtown, Idaho. Tri-Pro received a modified Permit to Construct (PTC) on December 17, 2001. The modified PTC added permit conditions to cease operations of hogged fuel-fired boilers, to formally limit facility's annual maximum lumber production of 90 million board feet, and to add a 7.87 MMBtu/hr propane-fired boiler. With this modified PTC, the facility became a synthetic minor facility and was not required to obtain a Tier I operating permit. Atmospheric dispersion modeling analyses were not conducted in support of the modified PTC. However, Tri-Pro was required by the modified PTC to submit a Tier II operating permit application to demonstrate compliance with National Ambient Air Quality Standards (NAAQS) within six months of the PTC issuance.

On July 24, 2002, DEQ received a Tier II operating permit application from Lorenzen Engineering, Inc. (Lorenzen), Tri-Pro's consultant. Additional information was received by DEQ on June 14, 2002, July 24, 2002, August 5, 2002, December 5, 2002, December 16, 2002, December 17, 2002, December 18, 2002, and January 2, 2002. Tri-Pro stated in their July 24, 2002 submittal that they would permanently discontinue operation of the Olivine Woodwaste Incinerator and had closed exhaust of DEQ #5 Trimmer Cyclone. The Tier II operating permit and modeling analyses will address these changes and to keep the facility in a synthetic minor status.

No Tier II operating permit can be granted, per IDAPA 58.01.01.403.02, unless the applicant demonstrates to the satisfaction of DEQ that emissions from the facility "would not cause or significantly contribute to a violation of any ambient air quality standard." Atmospheric dispersion modeling was performed by Lorenzen to fulfill these requirements. No other modeling related requirements were identified for this Tier II operating permit.

## 2.2 Applicable Air Quality Impact Limits and Analyses

### 2.2.1 Area Classification

Tri-Pro is located in Bonner County, designated as an attainment or unclassifiable area for sulfur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), carbon monoxide (CO), lead (Pb), ozone (O<sub>3</sub>), and particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM<sub>10</sub>). There is no Class I area within 10 kilometers of the facility.

### 2.2.2 Significant Impact and Full Impact Analyses

If estimated maximum impacts to ambient air from the emissions sources at the facility exceed the "significant contribution" levels of IDAPA 58.01.01.006.93, then a full impact analysis is necessary per DEQ modeling guidance. A full impact analysis for attainment area pollutants involves adding ambient impacts from facility-wide emissions to DEQ approved background concentration values that are appropriate for the criteria pollutant/averaging-time at the facility location. The resulting maximum pollutant concentrations in ambient air are then compared to the NAAQS listed in Table 1. Table 1 also lists significant contribution levels and specifies the modeled value that must be used for comparison to the NAAQS.

Table 1. Applicable Regulatory Limits

Pollutant	Averaging Period	Significant Contribution Level <sup>a</sup> (µg/m <sup>3</sup> ) <sup>b</sup>	Regulatory Limit <sup>c</sup> (µg/m <sup>3</sup> )	Modeled Value Used <sup>d</sup>
PM <sub>10</sub> <sup>e</sup>	24-hour	5.0	150 <sup>f</sup>	Maximum 6 <sup>th</sup> highest <sup>g</sup>
	Annual	1.0	50 <sup>h</sup>	Maximum 1 <sup>st</sup> highest <sup>g</sup>
Carbon monoxide (CO)	1-hour	2,000	40,000 <sup>f</sup>	Maximum 2 <sup>nd</sup> highest <sup>g</sup>
	8-hour	500	10,000 <sup>f</sup>	Maximum 2 <sup>nd</sup> highest <sup>g</sup>
Sulfur dioxide (SO <sub>2</sub> )	3-hour	25	1,300 <sup>f</sup>	Maximum 2 <sup>nd</sup> highest <sup>g</sup>
	24-hour	5	365 <sup>f</sup>	Maximum 2 <sup>nd</sup> highest <sup>g</sup>
	Annual	1.0	80 <sup>h</sup>	Maximum 1 <sup>st</sup> highest <sup>g</sup>
Nitrogen dioxide (NO <sub>2</sub> )	Annual	1.0	100 <sup>h</sup>	Maximum 1 <sup>st</sup> highest <sup>g</sup>
Lead (Pb)	Quarterly	NA	1.5 <sup>h</sup>	Maximum 1 <sup>st</sup> highest <sup>g</sup>

a. IDAPA 58.01.01.006.93

b. Micrograms per cubic meter

c. IDAPA 58.01.01.577

d. When using five years of meteorological data

e. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers

f. Not to be exceeded more than once per year

g. Concentration at any modeled receptor using five years of meteorological data

h. Not to be exceeded

### 2.2.3 Toxic Air Pollutant Impact Analysis

An ambient air assessment of Toxic Air Pollutant (TAP) impacts was not necessary, per the DEQ Air Program Division, for the facility to demonstrate compliance with IDAPA 58.01.01.161.

## 2.3 Background Concentrations

DEQ provided Lorenzen with background concentration values in July 2002. These were based on a refined assessment of applicable background concentration values, conducted by DEQ State Office of Technical Services (Technical Services), for numerous areas in Idaho. Background concentrations in areas where no monitoring data are available were based on monitoring data from areas with similar population density, meteorology, and emissions sources. Table 2 lists these revised background

concentrations. Some concentrations in Table 2 are slightly lower than values provided to Lorenzen because of minor refinements made in the DEQ assessment since July 2002.

**Table 2. Background Concentrations**

Pollutant	Averaging Period	Background Concentration ( $\mu\text{g}/\text{m}^3$ ) <sup>a</sup>
PM <sub>10</sub> <sup>b</sup>	24-hour	81
	Annual	26
Carbon monoxide (CO)	1-hour	10,200
	8-hour	3,400
Sulfur dioxide (SO <sub>2</sub> )	3-hour	42
	24-hour	26
	Annual	8
Nitrogen dioxide (NO <sub>2</sub> )	Annual	32
Lead (Pb)	Quarterly	0.03

<sup>a</sup> Micrograms per cubic meter

<sup>b</sup> Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers

## 2.4 Modeling Impact Assessment

Table 3 provides a summary of the modeling parameters used for the DEQ analyses.

**Table 3. Modeling Parameters**

Parameter	Description/Values	Documentation/Additional Description
Model	ISCST3	Version 02035
Meteorological data	Surface and Upper Air Spokane, Washington	1987-1991: Flow vectors rotated by – 45 degrees to reflect the valley alignment
Model options	Regulatory Default	
Land use	Rural	Low population density in area and large fraction of unimproved land
Terrain	7.5 min DEM	Receptor elevations automatically extracted from DEM by BEEST software
Building downwash	Used building profile input program for ISCST3 (BPIP)	Building dimensions obtained from modeling files submitted
Receptor grids (See Figure 1)	Grid 1	25 meter spacing along site boundary out to 100 meters
	Grid 2	50 meter spacing out to about 500 meters
	Grid 3	100 meter spacing out to about 2,000 meters
	Grid 4	500 meter spacing out to about 6,800 meters
Facility location (UTM) <sup>a</sup>	Easting	498 kilometers
	Northing	5,336 kilometers

<sup>a</sup> Universal Transverse Mercator

### 2.4.1 Modeling Protocol

A modeling protocol was submitted to DEQ on October 4, 2002. Discussions pertaining to dispersion modeling issues occurred between DEQ and Lorenzen prior to the December 2002 submittal.

### 2.4.2 Model Selection

The initial ambient air impact analyses were performed by Lorenzen, Tri-Pro's consultant, using the model ISCST3. The facility layout was reviewed by DEQ to evaluate the potential need for calculating concentrations within building recirculation cavities. Building/source pairs near the facility's ambient air boundary were further evaluated, using SCREEN3, to determine whether specific source plumes

could be entrained in recirculation cavities and to calculate the downwind length of recirculation cavities. This analysis is presented in Attachment A of this memorandum and indicates that ambient air receptors are located beyond the recirculation cavities of buildings present at the facility.

#### 2.4.3 Meteorological Data

Surface and upper air meteorological data from Spokane, Washington, for 1987 through 1991, were used in the modeling analyses. Lorenzen rotated the wind flow vectors by -45 degrees to better account for the valley orientation in the Oldtown area as compared to the Spokane, Washington, airport. This approach was discussed with DEQ prior to the application submittal. DEQ State Office of Technical Services (Technical Services) determined that these data, with the stated modifications, were the most representative data available for the area.

#### 2.4.4 Terrain Effects

The modeling analyses submitted by Lorenzen considered elevated terrain. Source, building, and receptor elevations were regenerated for the DEQ verification modeling using USGS 7.5 minute Digital Elevation Model (DEM) files. The following DEM files were used in the analyses:

- 48116B8.DEM, Priest River, Idaho
- 48117B1.DEM, Newport, Washington

The Priest River DEM was obtained from the WebMET.com website at <http://www.webmet.com>. The Newport DEM was obtained from Lorenzen, since it was not available from the WebMET.com site and only the 1 degree DEM was available through internal DEQ resources. Lorenzen indicated the Newport DEM was originally obtained from a USGS-affiliated site titled MapMart.

#### 2.4.5 Facility Layout

DEQ verified proper identification of the facility boundary and buildings on the site by comparing the modeling input to a facility plot plan submitted with the application and aerial photographs of the area. Figure 1 shows the emission sources, buildings, and receptors included in the dispersion modeling analysis.

#### 2.4.6 Building Downwash Effects

Plume downwash effects caused by structures present at the facility were accounted for in the modeling analyses. The Building Profile Input Program for ISCST3 (BPIP) was used to calculate direction-specific building dimensions and Good Engineering Practice (GEP) stack height information from building dimensions/configurations and emissions release parameters. DEQ verification modeling was conducted using regenerated parameters from BPIP.

#### 2.4.7 Ambient Air Boundary

The boundary to ambient air was determined in the application by methods described in the *Idaho Modeling Guideline*. A combination of fences and the Pend Oreille River comprise the boundary to ambient air. The ambient air boundary can be observed in Figure 2.

#### 2.4.8 Receptors

Modeling submitted by Lorenzen utilized the following receptor grid: 25 meter spacing along the facility fenceline; 100 meter spacing out to a distance of about 2,000 meters from the facility boundary; 500 meter spacing out to a distance of about 7,000 meters. A second modeling run, using a receptor density of 10 meters, was conducted by Lorenzen for an area exhibiting the highest ambient concentrations. DEQ verification modeling was conducted using the following DEQ-generated grid of ambient air receptors: 25 meter spacing out to 100 meters from the fenceline; 50

meter spacing out to about 200 meters; 100 meter spacing out to about 2,000 meters; 500 meter spacing out to about 6,800 meters. A receptor grid extending out to about 7,000 meters was used to ensure that emissions from the 30 ft stack, under stable atmospheric conditions, would not cause high pollutant concentrations at distant receptors located on elevated terrain.

#### 2.4.9 Emissions Rates

Emissions rates used in the dispersion modeling analyses submitted by the applicant were reviewed against those in the permit application and the proposed permit. The following approach was used for DEQ verification modeling:

- All modeled emissions rates were equal to or slightly greater than the facility's emissions calculated in the Tier II operating permit application or the permitted allowable rate.
- Modeling results were compared to "significant contribution" thresholds. More extensive review of modeling parameters selected was conducted when model results approached applicable thresholds.

Table 4 provides emissions quantities for criteria pollutants.

**Table 4. Criteria Pollutant Emissions Rates Used for Modeling**

Source (Id Code)		Hourly Rate Used for Modeling (lb/hr) <sup>a</sup>			
	Pollutant	PM <sub>10</sub> <sup>b</sup>	CO <sup>c</sup>	SO <sub>2</sub> <sup>d</sup>	NO <sub>x</sub> <sup>e</sup>
Boiler (PBOILER)		0.03	0.16	0.04	1.20
Lumber Drying Kiln, 2 horizontal outlets (KILNN, KILNS)		0.143 <sup>f</sup>	—	—	—
DEQ #1 Fuel Bin Cyclone (DEQ#1)		0.86 <sup>f</sup>	—	—	—
DEQ #2 Shavings Bin Cyclone (runs alternately with DEQ #7 Shavings Bin Cyclone) (DEQ#2)		1.60	—	—	—
DEQ #3 Planer Shavings Cyclone (DEQ#3)		2.00	—	—	—
DEQ #4 Trimmer Bin Cyclone (DEQ#4)		1.80	—	—	—
DEQ #5 Planer Chipper Cyclone (DEQ#5)		0.69	—	—	—
DEQ #6 Trimmer Cyclone (exhaust permanently capped)		0.0	—	—	—
DEQ #7 Shavings Bin Cyclone		Runs alternately with DEQ #2 Shavings Bin Cyclone. Not modeled.			
DEQ #12 Bark Cyclone (DEQ#12)		1.29 <sup>f</sup>	—	—	—

<sup>a</sup> Pounds per hour

<sup>b</sup> Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers

<sup>c</sup> Carbon monoxide

<sup>d</sup> Sulfur dioxide

<sup>e</sup> Oxides of nitrogen

<sup>f</sup> Emissions value differs from value in originally submitted application (see below)

Emissions of PM<sub>10</sub>, NO<sub>x</sub>, and CO from the propane-fired boiler were estimated based on emissions factors published in Table 1.5-1 of AP-42, Rev 10/96 and the boiler's design capacity, as explained in the DEQ Engineering Technical Memorandum. Modeling analyses submitted conservatively assumed 100% of NO<sub>x</sub> emissions were NO<sub>2</sub>. SO<sub>2</sub> emissions estimates were provided by Lorenzen, based on Santa Barbara County Air Pollution Control District (SBAPCD) Engineering Division, application processing and calculations guidance for SO<sub>x</sub> emission factors for gaseous fuel.

The PM<sub>10</sub> and VOC emissions from the dehumidification lumber drying kilns were calculated using emissions factors from *Idaho DEQ Emission Factor Guide for Wood Industry* (rev.11/99), using a 90% control efficiency for PM<sub>10</sub> emissions. The justification of 90% control efficiency was provided in Tri-Pro's December 16, 2002 submittal.

The standard cubic feet per minute (scfm) design air flow capacities, provided in Tri-Pro's Tier II operating permit application, were used to estimate PM<sub>10</sub> emissions from the cyclones. PM<sub>10</sub> emissions factors for the cyclones, in the form of grains per standard foot of flow, were obtained from the *Idaho DEQ emission factor Guide for Wood Industry* (rev.11/99). Daily allowable emissions were

calculated by assuming maximum hourly rates for a daily maximum operational schedule of 16 hours per day.

Hourly modeled emissions from the cyclones were calculated by dividing the permitted daily emissions by 24. DEQ modified emissions rates in the model for some sources to maintain consistency with the proposed permit. The following describes those changes made to emissions rates used in the modeling:

- PM<sub>10</sub> emissions of 20.6 lb/day (0.86 lb/hr for 24 hour emissions) were listed in the proposed DEQ permit for the DEQ #1 Cyclone, whereas an emissions rate of 0.89 lb/hr was modeled by Lorenzen.
- PM<sub>10</sub> emissions of 30.9 lb/day (1.29 lb/hr for 24 hour emissions) were listed in the DEQ permit for the DEQ #12 Cyclone, whereas an emissions rate of 0.51 lb/hr was modeled by Lorenzen.
- PM<sub>10</sub> emissions of 0.285 lb/hr (0.143 lb/hr for each of two vents) were listed in the DEQ permit for the drying kilns, whereas an emissions rate of 0.1 lb/hr for each vent was modeled by Lorenzen.

Fugitive emissions from a number of storage bin loading/unloading activities, debarking, hog operations, and other miscellaneous sawing were not included in the modeling analyses. Lorenzen indicated that these emissions are sporadic and can be effectively controlled through numerous implemented control measures, such as monitoring and control of visible emissions. DEQ Technical Services concurs that exclusion of these sources are appropriate if reasonable emissions controls are implemented and demonstrated by the facility.

#### 2.4.8 Emissions Release Parameters

Table 5 provides emissions release parameters, including stack location, stack height, stack diameter, exhaust temperature, and exhaust velocity. The parameters used in the model were those provided in electronic modeling files submitted by Lorenzen, except as described below.

**Table 5. Emissions and Stack Parameters**

Source / Location	Source Type	Stack Height (m) <sup>a</sup>	Modeled Diameter (m)	Stack Gas Temp. (K) <sup>b</sup>	Stack Gas Flow Velocity (m/sec) <sup>c</sup>
PBOILER, 498315E, 5336403N	Point, rain-capped	9.14	38 <sup>d</sup>	450	0.001
KILNN, 498263E, 5336455N	Point, horizontal	6.7	0.001 <sup>e</sup>	294	0.001
KILNS, 498263E, 5336437N	Point, horizontal	6.7	0.001 <sup>e</sup>	294	0.001
DEQ#1, 498150E, 5336502N	Point, horizontal	30.8	0.001 <sup>e</sup>	293	0.001
DEQ#2, 498291E, 5336552N	Point, horizontal	22.9	0.001 <sup>e</sup>	293	0.001
DEQ#3, 498380E, 5336503N	Point, horizontal	15.2	0.001 <sup>e</sup>	293	0.001
DEQ#4, 498290E, 5336545N	Point, rain-capped	24.4	0.91	293	0.001
DEQ#5, 498299E, 5336562N	Point, horizontal	12.2	0.001 <sup>e</sup>	293	0.001
DEQ#12, 498554E, 5336505N	Point, rain-capped	13.7	0.91	293	0.001

<sup>a</sup> Meters

<sup>b</sup> Kelvin

<sup>c</sup> Horizontal release set at 0.001 to eliminate momentum induced plume rise

<sup>d</sup> Diameter increased to account for thermal buoyancy while eliminating momentum induced plume rise with the 0.001 m/sec flow velocity

<sup>e</sup> Diameter set at 0.001 m to effectively eliminate stack tip downwash for horizontal releases

The boiler stack (PBOILER) flow velocity was set to 0.001 m/sec to eliminate momentum induced plume rise because of the presence of a rain cap. Thermal buoyancy should still be considered because of the elevated temperature of the stack gas. To properly account for thermal buoyancy in this instance, the stack diameter was increased to the point where the modeled stack volumetric flow was equal to the actual stack flow. Lorenzen initially used a Boiler stack flow of nearly 8,000 actual

cubic feet per minute (acfm). A combustion evaluation, performed by DEQ based on the allowable fuel usage, indicated a flow of only about 2,400 acfm with 10% excess air. A stack diameter of 38 meters corresponds to a flow of 2,423 acfm when using a stack gas velocity of 0.001 m/sec. Lorenzen was advised of this modification and concurred with the DEQ-calculated flow rate.

### 3.0 MODELING RESULTS:

This Section describes dispersion modeling results from the significant impact analysis and the full impact analysis.

#### 3.1 Significant Impact Analysis Results

Modeled ambient air impact results from the significant impact analysis are provided in Table 6 for facility-wide emissions. The applicant did not conduct a separate Significant Impact Analysis, but modeled all pollutants in a full impact analysis. The values reported in this table were obtained from the applicant's submittal. Results from an independent review and verification analysis conducted by DEQ Technical Services are listed in parentheses. Differences between the two analyses are attributable to changes in the emissions rates of some sources and the modification to the boiler diameter to more properly account for thermal buoyancy. Because the potential ambient impact of facility-wide emissions are greater than significant contribution levels for 24-hour and annual PM<sub>10</sub> and annual NO<sub>2</sub>, a full impact analysis was performed.

Table 6. Significant Impact Analysis for Criteria Pollutants

Pollutant	Averaging Period	Ambient Impact ( $\mu\text{g}/\text{m}^3$ ) <sup>a,b</sup>	Significant Contribution <sup>c</sup> ( $\mu\text{g}/\text{m}^3$ )	Full Impact Analysis Required (Y or N)
PM <sub>10</sub> <sup>d</sup>	24-hour	48.6 <sup>e</sup> (63.2)	5.0	Y
	Annual	6.7 (8.2)	1.0	Y
Carbon monoxide (CO)	1-hour	25.7 <sup>e</sup> (39.5)	2,000	N
	8-hour	9.6 <sup>e</sup> (15.2)	500	N
Sulfur dioxide (SO <sub>2</sub> )	3-hour	4.2 <sup>e</sup> (6.8)	25	N
	24-hour	1.6 <sup>e</sup> (2.3)	5	N
	Annual	0.17 (0.28)	1.0	N
Nitrogen dioxide (NO <sub>2</sub> )	Annual	5.0 (8.3)	1.0	Y

<sup>a</sup> Concentration in micrograms per cubic meter

<sup>b</sup> First values listed are impacts submitted by the applicant; values in parentheses are results from DEQ verification modeling

<sup>c</sup> Significant contribution level as per IDAPA 58.01.01.006.93

<sup>d</sup> Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers

<sup>e</sup> Impacts submitted by the applicant for averaging periods of 24 hours and less are the maximum of modeled 2<sup>nd</sup> high results at each receptor

#### 3.2 Full Impact Analysis Results

A full impact analysis for attainment area pollutants involves modeling facility-wide emissions and adding an appropriate background concentration value to those results. Results of the full impact analysis are presented in Table 7.

Modeled air pollutant concentrations in ambient air, including a conservative background concentration value, are all well below NAAQS. The maximum of 6<sup>th</sup> highest PM<sub>10</sub> concentrations at all receptors for the 24-hour averaging period is 83% of the NAAQS. Table 8 shows the individual contributions of the boiler, kilns, and cyclones to modeled PM<sub>10</sub> concentrations in ambient air. These estimated group-specific impacts are from DEQ verification modeling results only. PM<sub>10</sub> impacts from the boiler are nearly negligible, with a maximum impact of less than 10% of that associated with either the kilns or the cyclones. The maximum impact of the kilns, at 20  $\mu\text{g}/\text{m}^3$ , is about half that associated

with the combined impact of 39  $\mu\text{g}/\text{m}^3$  from the cyclones. The cyclones have a larger effect on ambient air because of their low temperature horizontal release and larger cumulative emissions rate. Figure 2 shows 6<sup>th</sup> highest 24-hour averaged modeled PM<sub>10</sub> concentrations. The entire modeling domain is not shown in Figure 2.

**Table 7. Full Impact Analysis for Criteria Pollutants (Facility-wide Emissions)**

Pollutant	Averaging Period	Ambient Impact. ( $\mu\text{g}/\text{m}^3$ ) <sup>a,b</sup>	Background Conc. ( $\mu\text{g}/\text{m}^3$ )	Total Ambient Conc. ( $\mu\text{g}/\text{m}^3$ )	Regulatory Limit <sup>c</sup> ( $\mu\text{g}/\text{m}^3$ )	Percent of NAAQS
PM <sub>10</sub> <sup>d</sup>	24-hour	48.6 <sup>e</sup> (42.8 <sup>f</sup> )	81 (81)	129.6 (123.8)	150	86 (83)
	Annual	6.7 <sup>g</sup> (8.2 <sup>g</sup> )	27 (26)	33.7 (34.2)	50	67 (68)
Nitrogen dioxide (NO <sub>2</sub> )	Annual	5.0 <sup>g</sup> (8.3 <sup>g</sup> )	32 (32)	37.0 (40.3)	100	37 (40)

<sup>a</sup>. Concentration in micrograms per cubic meter

<sup>b</sup>. First values listed are impacts submitted by the applicant; values in parentheses are results from DEQ verification modeling

<sup>c</sup>. IDAPA 58.01.01.577

<sup>d</sup>. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers

<sup>e</sup>. Impact modeled by Lorenzen (impacts for averaging periods of 24 hours and less are the modeled maximum of 2<sup>nd</sup> high results at each receptor)

<sup>f</sup>. Maximum 6<sup>th</sup> highest modeled value at any receptor

<sup>g</sup>. Maximum 1<sup>st</sup> highest modeled value at any receptor

**Table 8. Source-Specific PM<sub>10</sub><sup>d</sup> Contributions**

Source	Averaging Period	Ambient Impact. ( $\mu\text{g}/\text{m}^3$ ) <sup>b</sup>	Background Conc. ( $\mu\text{g}/\text{m}^3$ )	Total Ambient Conc. ( $\mu\text{g}/\text{m}^3$ )	Regulatory Limit <sup>c</sup> ( $\mu\text{g}/\text{m}^3$ )	Percent of NAAQS
Boiler	24-hour	1.3 <sup>d</sup>	81	82.3	150	55
	Annual	0.21 <sup>e</sup>	26	26.2	50	52
Kilns	24-hour	20.1 <sup>d</sup>	81	101.1	150	67
	Annual	3.7 <sup>e</sup>	26	29.7	50	59
Cyclones	24-hour	38.8 <sup>d</sup>	81	119.8	150	80
	Annual	7.8 <sup>e</sup>	26	33.8	50	68

<sup>a</sup>. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers

<sup>b</sup>. Concentration in micrograms per cubic meter

<sup>c</sup>. IDAPA 58.01.01.577

<sup>d</sup>. Maximum 6<sup>th</sup> highest modeled value at any receptor

<sup>e</sup>. Maximum 1<sup>st</sup> highest modeled value at any receptor

### 3.3 TAP Analysis Results

No TAP modeling analysis was conducted for this Tier II operating permit.

## 4.0 CONCLUSION

There were slight differences between modeling results submitted by Lorenzen and those obtained from DEQ verification analyses. These differences were primarily caused by differences in emissions rates for the kilns and cyclones and the flow parameters used to model the boiler. The emissions rates used in the DEQ verification modeling were those used in the proposed permit. Differences between the two analyses do not result in any differences in analysis applicability evaluations or overall conclusions.

All modeling results of criteria pollutants are well below NAAQS. Process fugitives were not included in the dispersion modeling analyses. However, if these sources are reasonably controlled it is estimated that impacts to ambient air would be negligible.

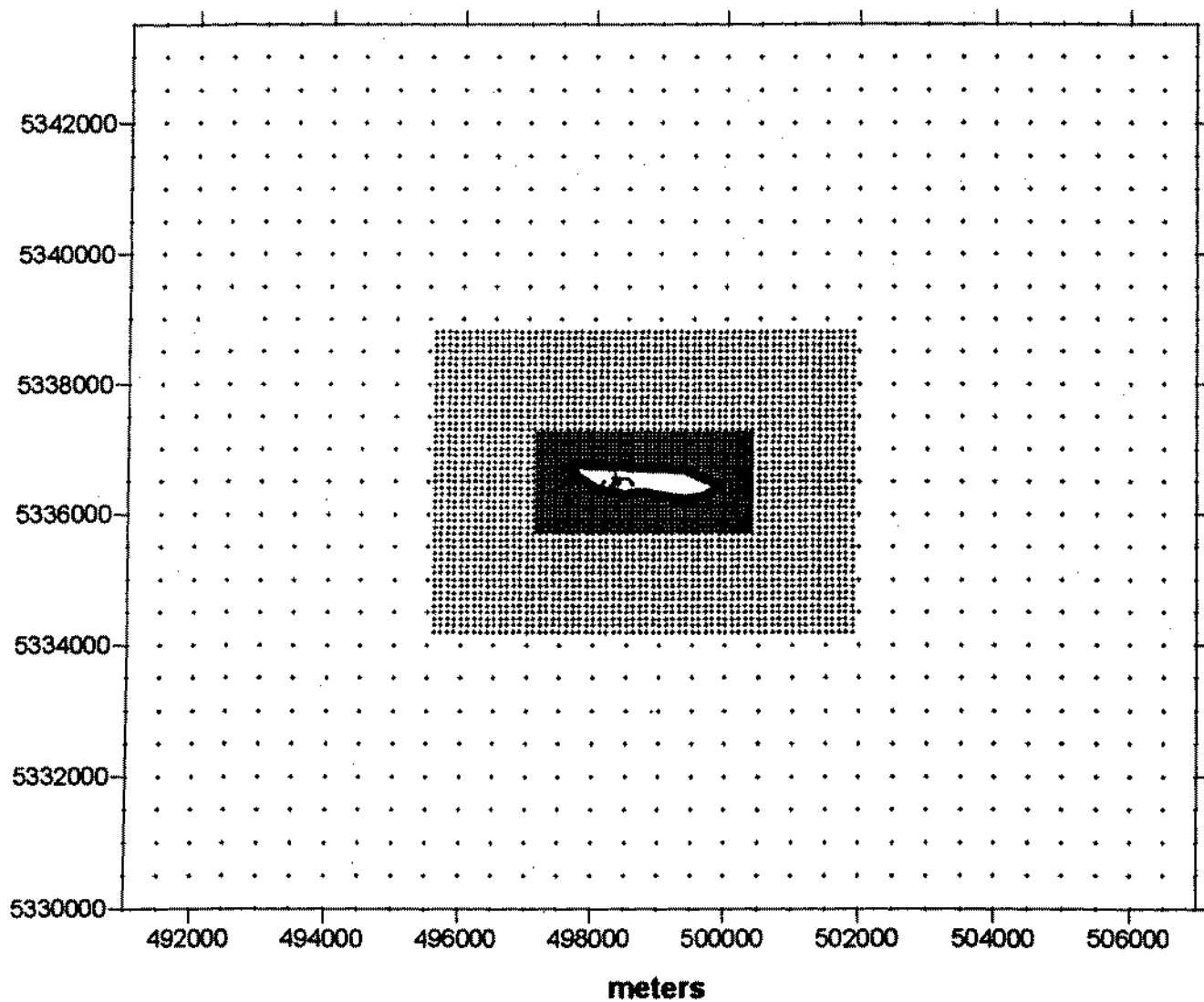
Electronic copies of the modeling analysis are saved on disk. Table 9 provides a summary of the files used in the modeling analysis. The permitting engineer has reviewed this modeling memo to ensure consistency with the Tier II operating permit and technical memorandum.

<b>Table 9. Dispersion Modeling Files</b>		
<b>Type of File</b>	<b>Description</b>	<b>File Name</b>
Met data	Surface and upper air from Spokane, Washington NWS data: January 1987 – December 1991	SpkXX.ASC (rural mixing heights adjusted)
BEEST input files	24-hour PM <sub>10</sub> , SO <sub>2</sub> , CO	TriPro24hour.BST
	Annual PM <sub>10</sub> , NO <sub>2</sub> , SO <sub>2</sub> ,	TriProXXAnn.BST XX = year of met data
Each BST file has the following type of files associated with it:		
Input file for BPIP program		.PIP
BPIP output file		.TAB
Concise BPIP output file		.SUM
BEE-Line file containing direction specific building dimensions		.SO
ISCST3 input file for each pollutant		.DTA
ISCST3 output list file for each pollutant		.LST
User summary output file for each pollutant		.USF
Master graphics output file for each pollutant		.GRF
Some modeling files have the following type of graphics files associated with them:		
Surfer data file		.DAT
Surfer boundary file		.BLN
Surfer post file containing source locations		.TXT
Surfer plot file		.SRF

KS: G:\TECHNICAL SERVICES\MODELING\SCHILLING\TRIPRO\TRIPRO MODELING TECH MEMO.DOC

**Figure 1 - Tri-Pro Tier II Operating Permit Modeling Review**

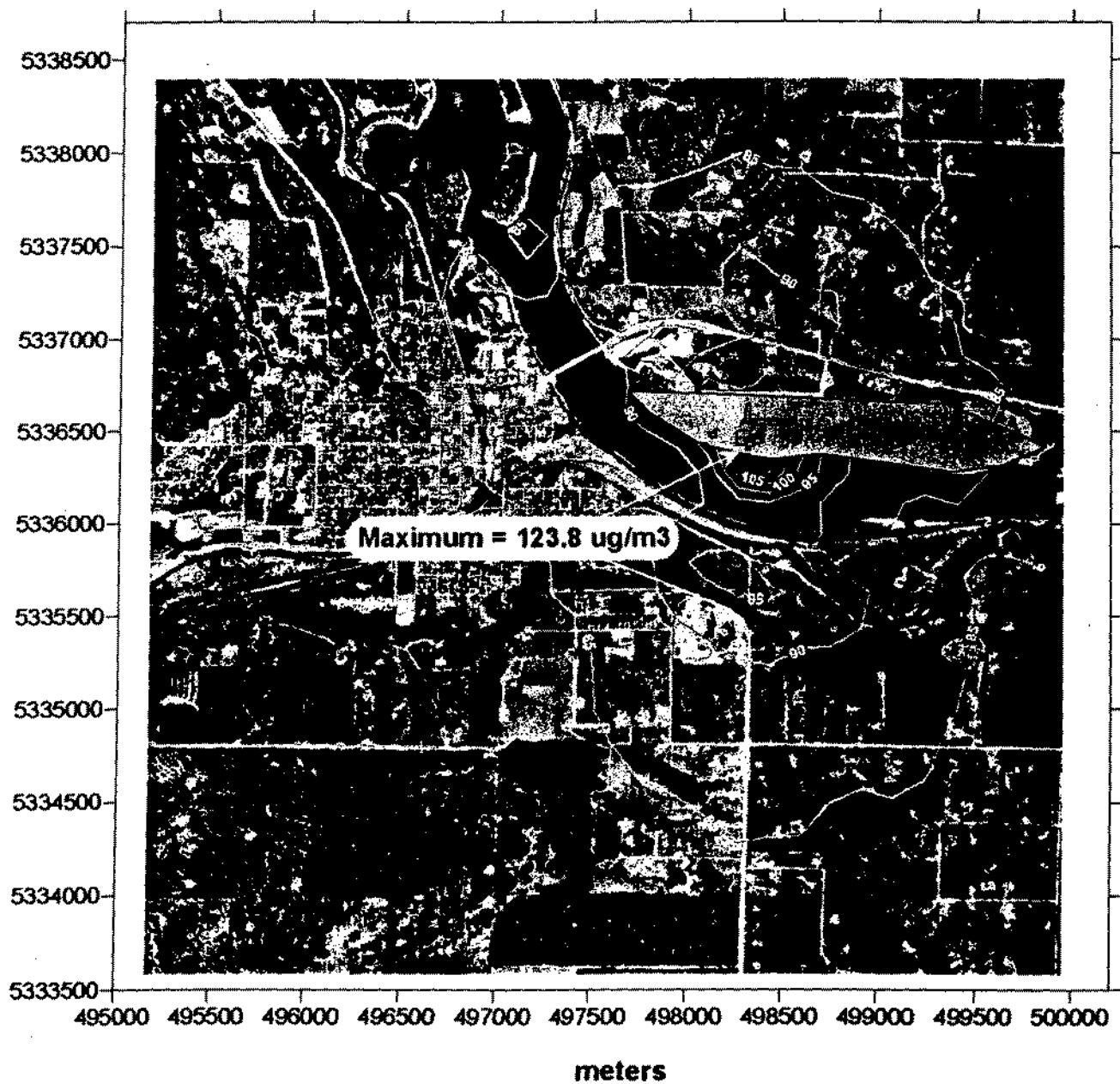
**Facility Layout, Emissions Sources, and Ambient Receptors**



## Figure 2 - Tri-Pro Tier II Operating Permit Modeling Review

Contours of 6th Highest 24-Hour Averaged PM<sub>10</sub> Concentrations

Includes 81 ug/m<sup>3</sup> Background Concentration





Project TriPro Tier II Work Order \_\_\_\_\_ File No. \_\_\_\_\_

Title of Calculation Modeling Review Prepared By K. Schilling Date 3/20/03

Item Building downwash cavity calc. Checked By \_\_\_\_\_ Date \_\_\_\_\_

### Cavity Assessment Kilns bldg

building height = 6.706 m

max. projected width = 3.8 cm (34.6 m/cm) = 131.5 m

min. projected width = 2.0 cm (34.6 m/cm) = 69.2 m

Stack height = 6.706 m (Source = KIUNS)

Stack Temp = 294 K

velocity = 0.001 m

diameter = 0.001 m

From Screen 3, maximum cavity distance = 39 m.

Approx. distance to boundary = 1.5 cm (34.6 m/cm) = 51.9 m

Distance to fence line is greater than cavity length, thus use of ISCST3 is adequate for downwash.

### Cavity Assessment Butler building

building height 13.72 m

max. projected width = 1.3 cm (34.6 m/cm) = 45 m

min. projected width = 0.6 cm (34.6 m/cm) = 20.8 m

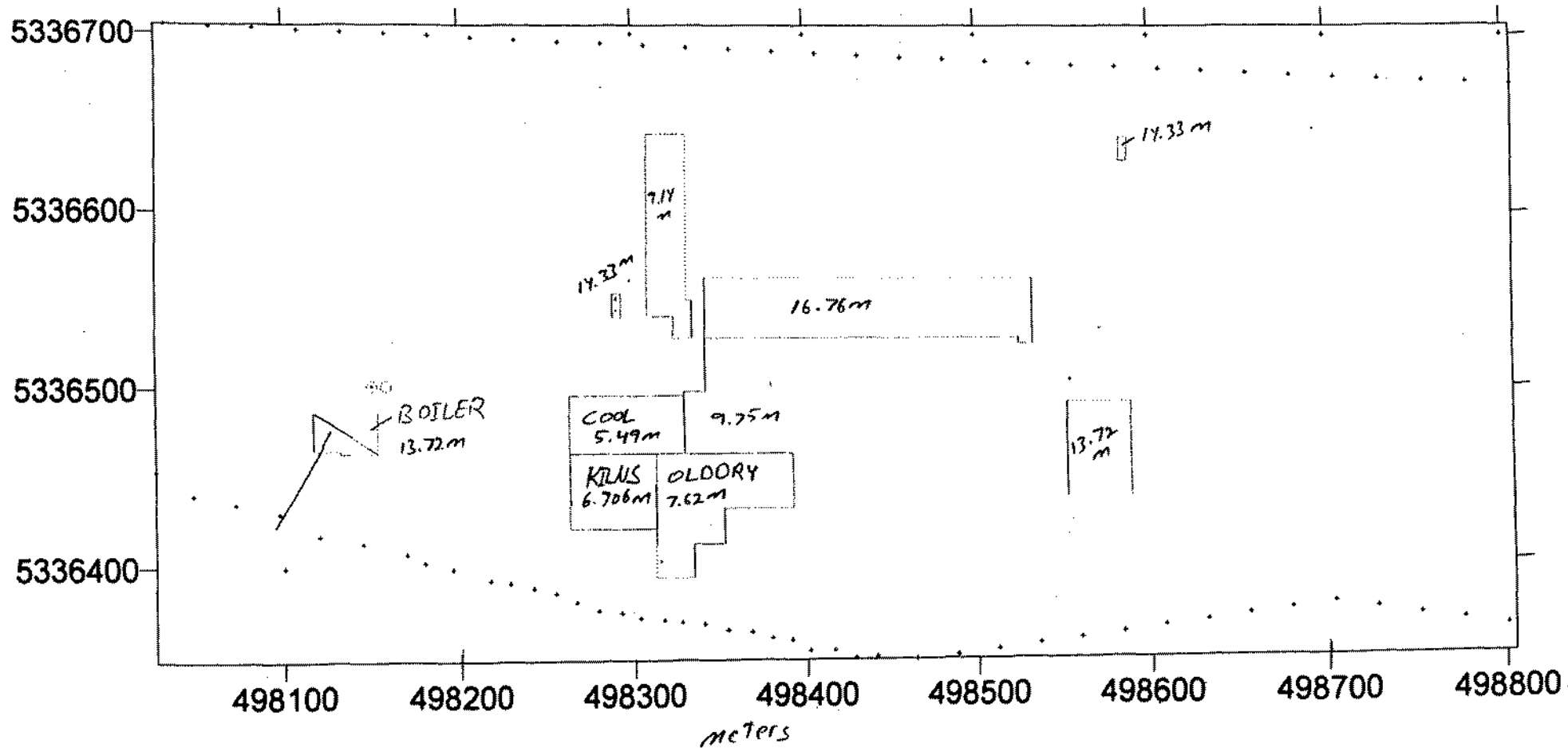
Stack height = 30.8 m (Source = DEQ #1)

Stack Temp = 293 K

velocity = 0.001

diameter = 0.001

From SCREENS, no cavity cone because critical windspeed > 20 m/sec for plume to be caught by building cavity.



$$\frac{17.45m}{500m} = 0.0289m \rightarrow \frac{34.6m}{cm}$$

02/22/03  
19:54:35

\*\*\* SCREEN3 MODEL RUN \*\*\*  
\*\*\* VERSION DATED 95250 \*\*\*

downwash boiler bldg

SIMPLE TERRAIN INPUTS:

SOURCE TYPE = POINT  
EMISSION RATE (G/S) = 1.00000  
STACK HEIGHT (M) = 30.8000  
STK INSIDE DIAM (M) = .0010  
STK EXIT VELOCITY (M/S) = .0010  
STK GAS EXIT TEMP (K) = 293.0000  
AMBIENT AIR TEMP (K) = 293.0000  
RECEPTOR HEIGHT (M) = .0000  
URBAN/RURAL OPTION = RURAL  
BUILDING HEIGHT (M) = 13.7200  
MIN HORIZ BLDG DIM (M) = 20.8000  
MAX HORIZ BLDG DIM (M) = 45.0000

BUOY. FLUX = .000 M\*\*4/S\*\*3; MOM. FLUX = .000 M\*\*4/S\*\*2.

\*\*\* FULL METEOROLOGY \*\*\*

\*\*\*\*\*  
\*\*\* SCREEN AUTOMATED DISTANCES \*\*\*  
\*\*\*\*\*

\*\*\* TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES \*\*\*

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
1.	.0000	0	.0	.0	.0	.00	.00	.00	NA
100.	234.7	6	1.0	1.9	10000.0	30.80	4.07	13.55	HS

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 1. M:  
138. 330.5 6 1.0 1.9 10000.0 30.80 5.52 16.48 HS

DWASH= MEANS NO CALC MADE (CONC = 0.0)  
DWASH=NO MEANS NO BUILDING DOWNWASH USED  
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED  
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED  
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3\*LB

\*\*\* CAVITY CALCULATION - 1 \*\*\*

CONC (UG/M\*\*3) = .0000  
CRIT WS @10M (M/S) = 99.99  
CRIT WS @ HS (M/S) = 99.99  
DILUTION WS (M/S) = 99.99  
CAVITY HT (M) = 16.78  
CAVITY LENGTH (M) = 39.84  
ALONGWIND DIM (M) = 20.80

\*\*\* CAVITY CALCULATION - 2 \*\*\*

CONC (UG/M\*\*3) = .0000  
CRIT WS @10M (M/S) = 99.99  
CRIT WS @ HS (M/S) = 99.99  
DILUTION WS (M/S) = 99.99  
CAVITY HT (M) = 14.03  
CAVITY LENGTH (M) = 26.40  
ALONGWIND DIM (M) = 45.00

CAVITY CONC NOT CALCULATED FOR CRIT WS > 20.0 M/S. CONC SET = 0.0

\*\*\*\*\*  
\*\*\* SUMMARY OF SCREEN MODEL RESULTS \*\*\*  
\*\*\*\*\*

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	330.5	138.	0.

\*\*\*\*\*  
\*\* REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS \*\*  
\*\*\*\*\*

02/22/03  
19:34:37

\*\*\* SCREEN3 MODEL RUN \*\*\*  
\*\*\* VERSION DATED 95250 \*\*\*  
downwash kilns bldg

SIMPLE TERRAIN INPUTS:

SOURCE TYPE = POINT  
EMISSION RATE (G/S) = 1.00000  
STACK HEIGHT (M) = 6.7060  
STK INSIDE DIAM (M) = .0010  
STK EXIT VELOCITY (M/S) = .0010  
STK GAS EXIT TEMP (K) = 294.0000  
AMBIENT AIR TEMP (K) = 293.0000  
RECEPTOR HEIGHT (M) = .0000  
URBAN/RURAL OPTION = RURAL  
BUILDING HEIGHT (M) = 6.7060  
MIN HORIZ BLDG DIM (M) = 69.2000  
MAX HORIZ BLDG DIM (M) = 131.5000

BUOY. FLUX = .000 M\*\*4/S\*\*3; MOM. FLUX = .000 M\*\*4/S\*\*2.

\*\*\* FULL METEOROLOGY \*\*\*

\*\*\* SCREEN AUTOMATED DISTANCES \*\*\*

\*\*\* TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES \*\*\*

DIST (M)	CONC (UG/M**3)	U10M STAB (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
1.	.0000	0	.0	.0	.00	.00	NA	
100.	3986.	6	1.0	1.0	10000.0	6.71	6.89	SS

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 1. M:  
21. .1029E+05 4 1.0 1.0 320.0 6.71 2.47 4.82 SS

DWASH= MEANS NO CALC MADE (CONC = 0.0)  
DWASH=NO MEANS NO BUILDING DOWNWASH USED  
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED  
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED  
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3\*LB

*** CAVITY CALCULATION - 1 ***				*** CAVITY CALCULATION - 2 ***			
CONC (UG/M**3)	=	756.0		CONC (UG/M**3)	=	1437.	
CRIT WS @10M (M/S)	=	1.00		CRIT WS @10M (M/S)	=	1.00	
CRIT WS @ HS (M/S)	=	1.00		CRIT WS @ HS (M/S)	=	1.00	
DILUTION WS (M/S)	=	1.00		DILUTION WS (M/S)	=	1.00	
CAVITY HT (M)	=	6.71		CAVITY HT (M)	=	6.71	
CAVITY LENGTH (M)	=	38.99		CAVITY LENGTH (M)	=	33.83	
ALONGWIND DIM (M)	=	69.20		ALONGWIND DIM (M)	=	131.50	

\*\*\* SUMMARY OF SCREEN MODEL RESULTS \*\*\*

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO TERRAIN MAX (M)	HT (M)
--------------------------	-----------------------	----------------------------	--------

SIMPLE TERRAIN	.1029E+05	21.	0.
BLDG. CAVITY-1	756.0	39.	— (DIST = CAVITY LENGTH)
BLDG. CAVITY-2	1437.	34.	— (DIST = CAVITY LENGTH)

\*\* REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS \*\*

## APPENDIX H

### Calculation of Required Emission Fees (Spreadsheet)

## Tier II Fee Calculation

### Instructions:

Insert the following information and answer the following questions either Y or N. Insert the permitted emissions in tons per year into the table. TAPS only apply when the Tier II is being used for New Source Review.

Company: Tri-Pro Cedar Products Inc.  
 Address: 1122 Highway 2  
 City: Oldtown  
 State: Idaho  
 Zip Code: 83822  
 Facility Contact: Mr. Steve Linton  
 Title: Operations Manager  
 AIRS No.: 017-00006

N

Did this permit meet the requirements of IDAPA 58.01.01.407.02 for a fee exemption Y/N?

N

Does this facility qualify for a general permit (i.e. concrete batch plant, hot-mix asphalt plant)? Y/N

N

Is this a syntheric minor permit? Y/N

Emissions (tons per year)	
NOX	0.0
PM10	36.8
PM	0.0
SO2	0.0
CO	0.0
VOC	67.5
HAPS/TAPS	
Total:	104.3
Fee Due	\$10,000.00

Fee Amount  
 (based on  
 emisisions)  
 10000

Comments: Since the processing of the permit occurred after July 1, 2002, the fee rules in IDAPA 58.01.01.407 apply.